"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

L 10152-67 EWT(m)/EWP(t)/ETI IJP(c) JD/DJ
ACC NR: AP6022507 SOURCE CODE: UR/0133/66/000/004/0327/0328

AUTHORS: Oyks, G. N.; Matevosyan, P. A.; Ansheles, I. I.; Fatkullin, O. Kh.; Selivanov, V. M.; Petrov, B. S.; Sivkov, S. S.; Fedorov, V. I.

ORG: none

TITLE: Experimental smelting of ball-bearing steel by using a refusing method employing a new technology

SOURCE: Stal', no. 4, 1966, 327-328

TOPIC TAGS: alloy steel, ball bearing steel, metallurgic research / ShKh15 alloy steel

ABSTRACT: A new technology for smelting ball-bearing steel employing a refusing method was developed. This method is based on the results of an earlier investigation by G. N. Oyks, P. A. Matevosyan, I. I. Ansheles, i dr. (Novaya tekhnologiya vyplavki sharikopodshipnikovoy stali, Metallurgizdat, 1962). The salient points of the new technology are: 1) the furnace charge consists of 100% ball-bearing steel scrap; 2) to insure desulfonation, the slag is reduced with pulverized coke only; 3) the oxygen concentration is maintained by additions of red hot bauxite. After the above three steps, the steel is evacuated and poured in the usual way. A comparison of the new method with older ones is presented (see Fig. 1). It is concluded that the new method yields ball-bearing steel of higher quality.

UDC: 669.187.2

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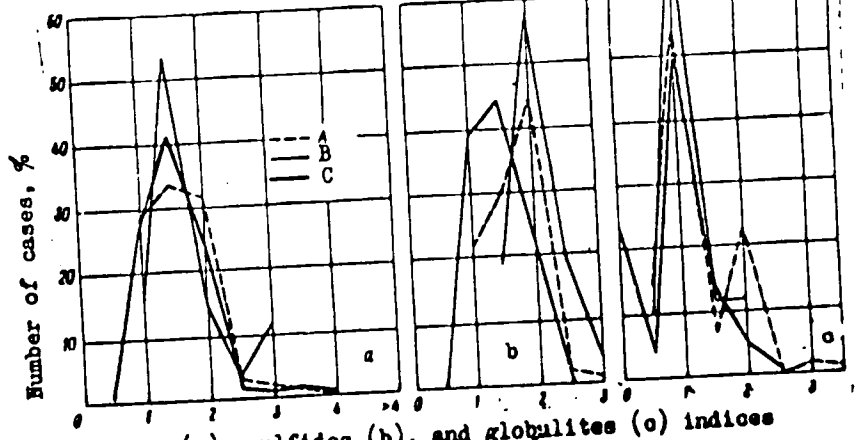


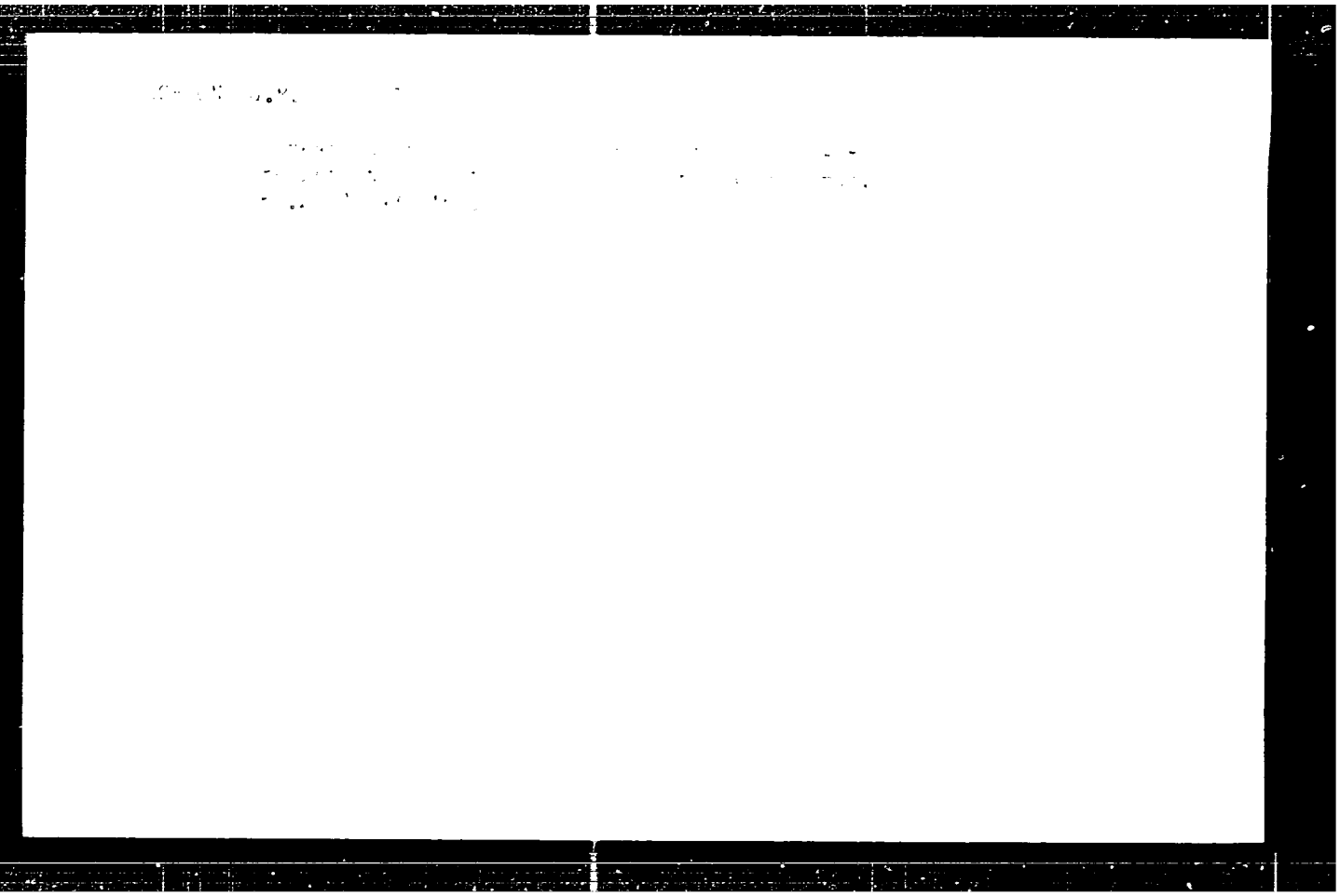
Fig. 1. Comparison of impurities in steel ShKh15: (a) oxides, (b) sulfides, and (c) globulites obtained by evacuation under usual slags (A) and slags of increased oxidative power (B - smelting with oxidation agent, C - smelting according to the new refusing method).

Orig. art. has: 2 tables and 2 graphs.

Card 2/2 bp SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 001

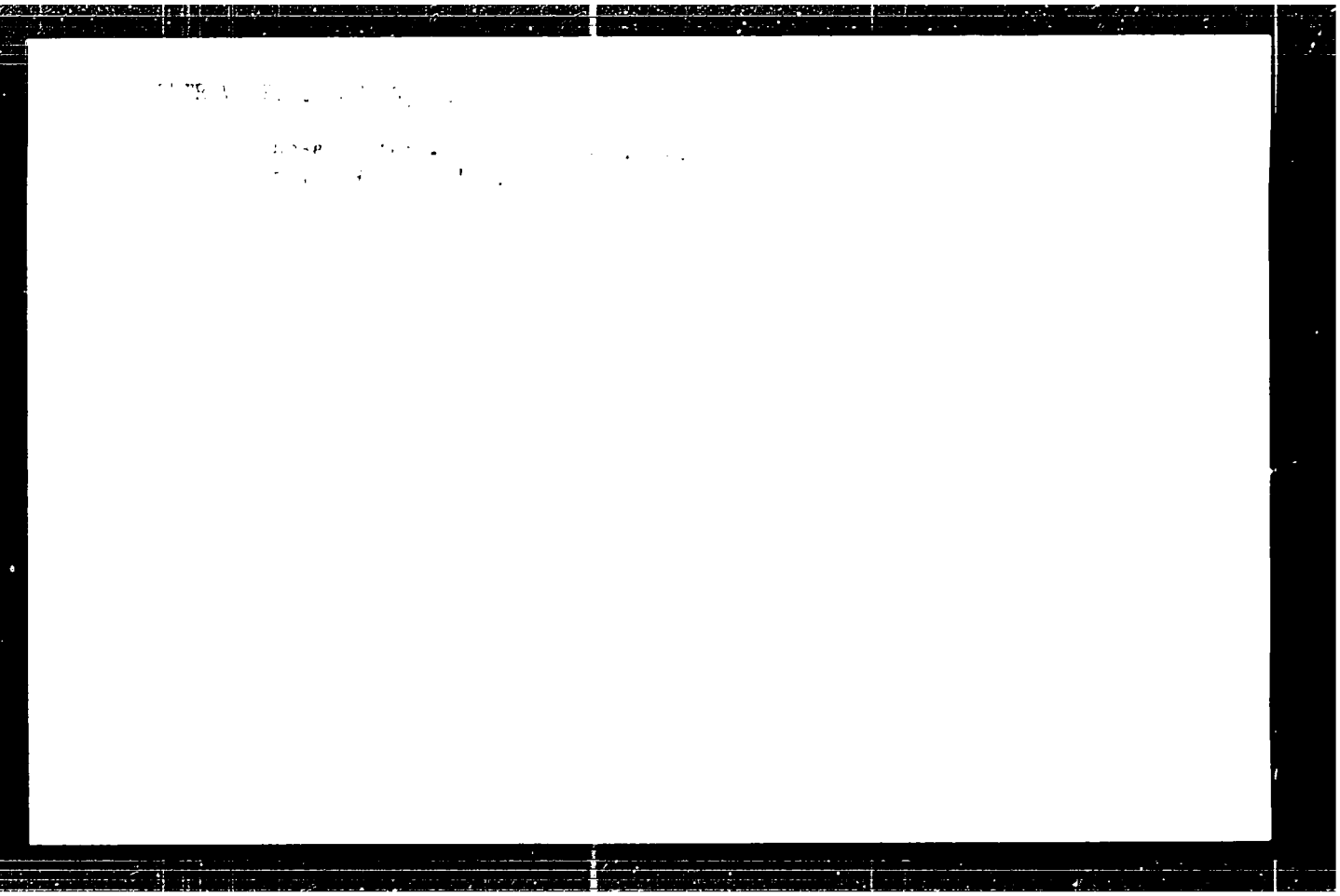
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PETROV, B.V.

Conference of inventors and efficiency promoters from nonferrous metal plants of Moscow and Moscow Province. TSvet.met. 28 no.1:76-78 Ja-F '55. (MIRA 10:10)
(Nonferrous metal industries)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

CHERLING, E.K.; KULIKOVA, T.V., IVITROV, B.V.; ZUL'FIKAROVA, Z.K.

Study of the suitability of amphiboles for the determination of the absolute age of rocks by the potassium argon method. Geokhimiia no.2:[illegible] F '65. (MIRA 18:6)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9"

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...ental ... f Massive Polymeric Materials

...ation of the orientation degree and by special additives which, for instance, ...ase the scratching. Two principles of orientation methods for oriented massive polymers were developed: the method of radial stretching and of compression. Several machines were developed for the production of special materials, e.g. for the glazing of airplane cabins. For the production process and ...ring with both methods as well as the physico-mechanical properties of oriented polymeric materials were investigated. It was found that these properties of the same polymer differ as strongly as the degree of orientation, ... of application of the two methods. This is ... the oriented material. Details in Figure ... shows the depth ... two perpendicular directions, strength limit ... of ... the orientation degree. It appears from experimental data that an increase in the degree of orientation (except for the specific regions of the oriented polymer. Figure ... shows the dependence of the ... of an oriented and of a non-oriented polymer on the test ...

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[illegible] of Massive Polymer Materials [illegible]

perature. It appears that several of these indices are much greater in the former polymer than in the latter. The authors finally discuss the results obtained. There are 4 figures 1 table, and 4 references, 3 of which are Soviet

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut aviatsionnykh materialov (All-Union Scientific Research Institute of Aircraft Materials

SUBMITTED: June [illegible], 1959

Card 2/2

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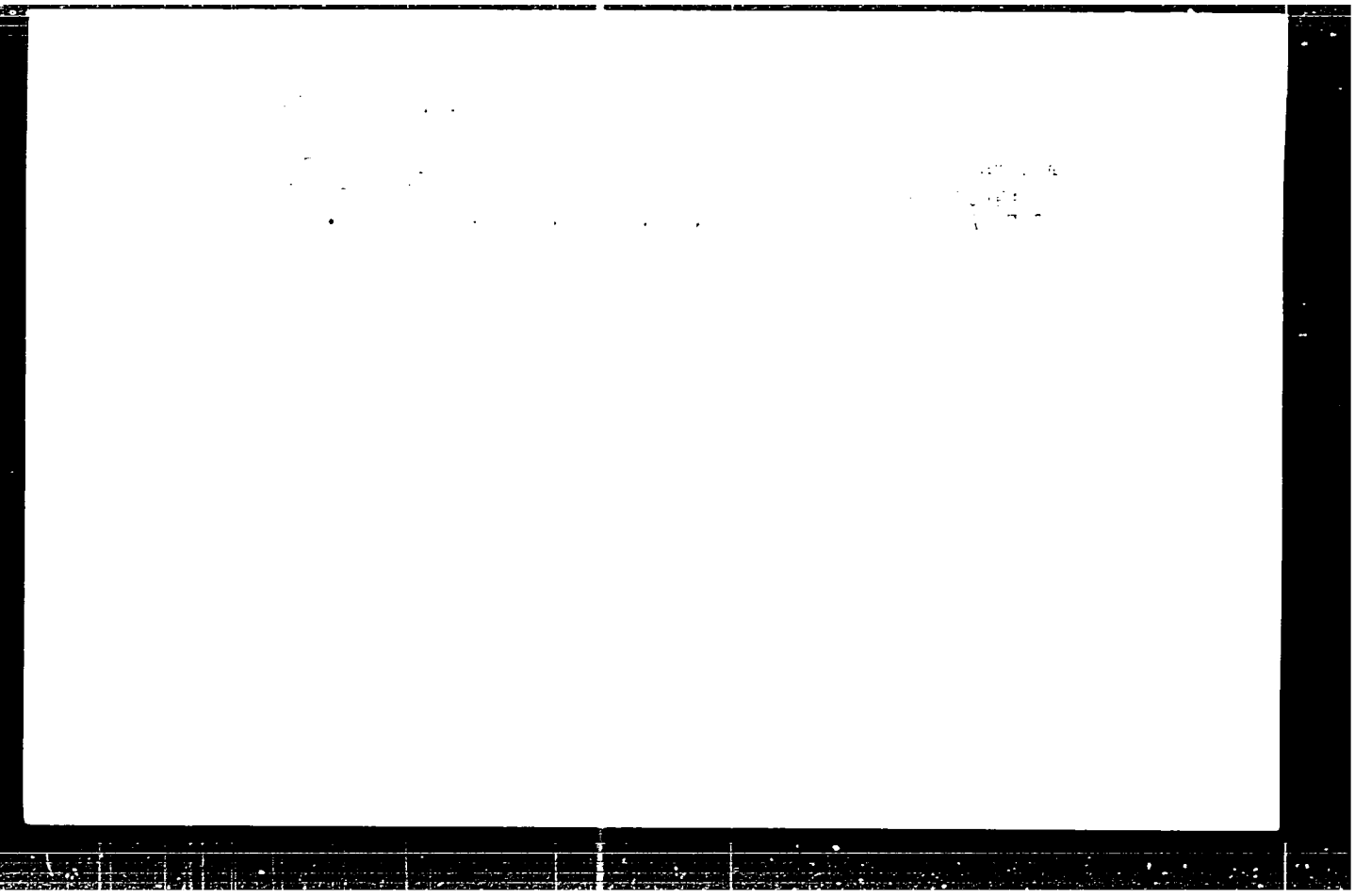
"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

PETROV, B.V.; FAYNGERSH, S.S.

Results of the competitions in enterprises of the nonferrous metal industry. Izobr.v SSSR 2 no.7:42 Jl '57. (MLRA 10:7)
(Nonferrous metal industries--Competitions)

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[illegible], . Ya.

USSR/Physics - Phosphorescence Feb 51

"Duration of Phosphorescence of Benzene and Its Derivatives," P. P. Dikun, A. A. Petrov, B. Ya. Sveshnikov

"Zhur Eksper i Teoret Fiz" Vol XXI, No 2, pp 150-163

Presents data obtained by authors and from lit on duration of metastable state of 60 benzene deriv and of 6 aliphatic ketones in soln at temp of liquid air. Shows, besides small exceptions, extinguishment const is same in ultraviolet, blue and green bands and extinguishment law is nearly exponential.

LC 180198

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

PETROV, B.Ye.

Spectrum analysis as applied to a nonlinear oscillatory system.
Radiotekhnika 19 no.7:3-13 Jl '64. (MIRA 17:12)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi im. A.S. Popova.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

PETROV, B.Ye.

Equivalent circuits of a triode and a transistor. Radiotekhnika 18 no.5:45-53 My '63. (MIRA 16:8)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.
(Transistors) (Electron tubes) (Equivalent circuits)

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

ACCESSION NR: AP4014928 S/0108/64/019/002/0003/0012

AUTHOR: Petrov, B. Ye. (Member)

TITLE: Polynomial approximation of characteristics of nonlinear elements

SOURCE: Radiotekhnika, v. 19, no. 2, 1964, 3-12

TOPIC TAGS: polynomial approximation, harmonic analysis, variable coefficient polynomial approximation, electronic oscillator, low degree polynomial approximation, nonlinear electronic device

ABSTRACT: For purposes of harmonic analysis, a new method of approximating the characteristics of nonlinear devices by means of a variable-coefficient polynomial is suggested; in general, the coefficients depend on the amplitudes and phases of the sinusoidal components that are applied to the nonlinear device. The method is based on the idea of interpolation between a finite number of values of the argument and the function. In earlier works, the selection of reference values of the argument and function was not correlated with the range of variation of the argument which resulted in higher degrees of the approximating polynomial. The introduction of variable coefficients permits retaining a high accuracy of the approximation, with a low degree of the approximating polynomial, in the range

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ACCESSION NR: AP4014528

of the amplitudes in question. An essential feature of the method is that the nonlinear-device characteristic is presented as consisting of an odd and an even part. It is suggested that an equal number of inflection points of the original function and the approximating polynomial (in their odd and even parts) be taken as a criterion of sufficient approximation. Hence, for example, a characteristic of an electron tube functioning without saturation should be approximated by a polynomial with a degree of 3 or higher. If saturation is involved, the polynomial should be a minimum of the 5th degree. An examination of an asynchronous signal applied to a self-excited oscillator is used for evaluating the error associated with the above variable-coefficient method. "The author extends his thanks to A. M. Zayezdny*y for his valuable comments which helped to improve the manuscript." Orig. art. has: 1 figure and 27 formulas.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunication)

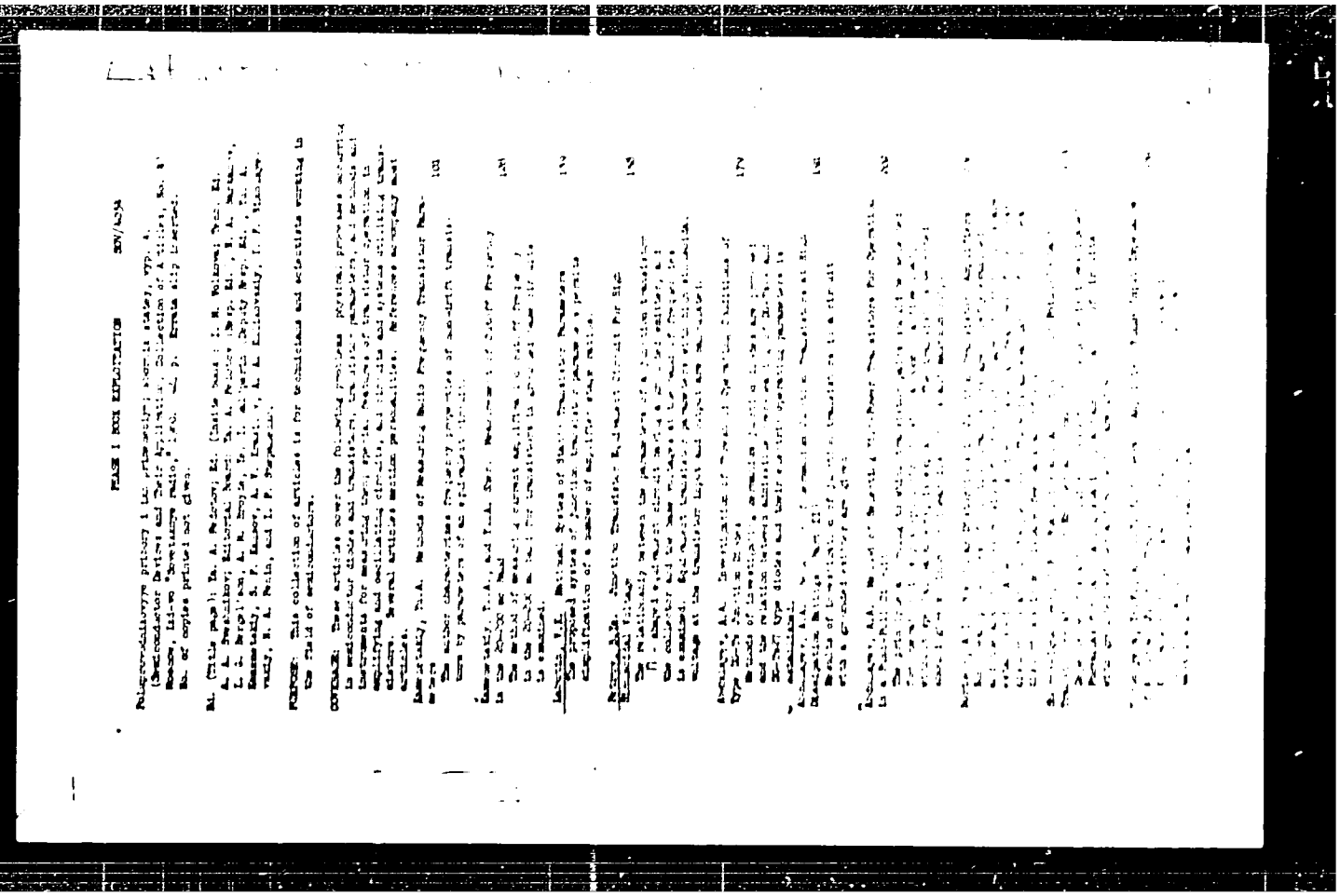
SUBMITTED: 01Aug62 DATE ACQ: 02Mar64 ENCL: 00

SUB CODE: GE NO REF SOV: 010 OTHER: 002

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L 12852-65 BSD/AEDC(b)/SSD/AFETR/AFWL/ASD(a)-5/RAEM(a)/RAEM(c)/RAEM(i)/ESD(c)/ESD(gs)/ESD(t)

ACCESSION NR: AP5000442 S/0108/64/019/007/0003/0012

AUTHOR: Petrov, B. Ye. (Active member)

TITLE: Special analysis applied to a nonlinear oscillator

SOURCE: Radiotekhnika, v. 19, no. 7, 1964, 3-12

TOPIC TAGS: spectrum analysis, oscillator, spectroscopy, electronics, electronic oscillator, electronic component

Abstract: Spectral analysis of an output function is carried out for the case when the argument acting on the nonlinear element is represented as a finite number of sinusoidal components. Criteria are developed for cases of nonsynchronous, partially synchronous, and synchronous frequency ratios of the active components. These criteria are used to select the degree of the approximating polynomial in accordance with the properties of the phenomenon being studied. The article is an extension of an earlier work by the author (Radiotekhnika, Vol 19, No 2, 1964). Orig. art. has: 24 equations.

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

L 12852-65
ACCESSION NR: AP5000442

ASSOCIATION: Nauchno tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A. S. Popova (Scientific Technical Society of Radio Engineering and Communication)

SUBMITTED: 01Aug62 ENCL: 00 SUB CODE: EC

NO REF SOV: 008 OTHER: 004 JPRS

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

S/194/61/000/005/[illegible]
D203/D303

9,2540 (also 1139, 1159, 1161)

AUTHOR: Petrov, B Ye

TITLE: Equivalent large sinusoidal volt[illegible] junction transistor

PERIODICAL: Referativnyy zhurnal Avtomatika i [illegible] no. 5, 1961, 18 abstract 5 D153 (V sb. Poluprovodnik. pribory i ikh primeneniye, no. 4 [illegible] radio, 1960, 158-178)

TEXT: Expressions are obtained for evaluating the [illegible] of components of an equivalent circuit in Π configuration for a junction transistor in common emitter connection and at large applied sinusoidal voltages. The slope S of the transfer characteristic is obtained together with the mutual and output conductances. These parameters make it possible to design power amplifiers with feedback and the steady states of generators in the [illegible] up to $1 - 2\omega_s$, where ω_s - frequency at which S at large [illegible]

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Equivalent large sinusoidal

decreases $\sqrt{2}$ times with respect to the value of S at LF. It is shown that the introduction, by analogy with the valve circu[illegible] of the idea of average slope of the junction transistor no[illegible] also at frequencies where it is necessary to take into account the phase shift between the input voltage and the collector curren[illegible] 14 references. / Abstracter's note: Complete translation.

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

L 21667-66
ACC NR: AT6004352 SOURCE CODE: UR/0108/65/020/010/0052/0060

AUTHOR: Petrov, B. Ye. (Active member)

ORG: Scientific and Technical Society of Radio Engineering and Electrocommunication (Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi)

TITLE: Frequency stability of transistorized and electron-tube oscillators

SOURCE: Radiotekhnika, v. 20, no. 10, 52-60 1965

TOPIC TAGS: electronic oscillator, frequency stability

ABSTRACT: Operating frequency stabilities of transistorized and electron-tube oscillators are theoretically compared; these assumptions are made: (a) oscillatory-circuit attenuations δ are equal; (b) low and equal working frequencies; (c) frequency-instability components of δ^2 order of magnitude are neglected; (d) both the transistor and electron tube are considered as nonlinear elements with frequency-dependent parameters. On the basis of h-f equivalent circuits of the transistor and electron tube, formulas for frequency instability due to oscillatory-circuit detuning, collector current and voltage variations, and temperature variations

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L 21667-66

ACC NR: AP6004352

of tube capacitances are derived. The temperature coefficient of transistors usually does not exceed that of oscillatory systems; as the transistors dissipate only small amounts of heat, it is not difficult to thermostat them. A numerical example with conventional Soviet-made transistors and tubes proves that the transistorized oscillator is not inferior to the tube type as far as its frequency stability is concerned. An experimental verification at 3 Mc is mentioned. Orig. art. has: 5 figures, 22 formulas, and 2 tables.

SUB CODE: 09 / SUBM DATE: 18Jun63 / ORIG REF: 017 / OTH REF: 001

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PETROV, Boris Petrovich; STEPANOV, Aleksandr Dmitriyevich; MINOV, D.K., prof., retsenzent; DAVYDOV, M.A., dots., retsenzent; KOSAREV, G.V., dots., retsenzent; TRAKHTMAN, L.M., dots., retsenzent; SIDOROV, N.I., red.; LARIONOV, G.Ye., tekhn. red.

[Electrical equipment and automation of electric rolling stock] Elektricheskoe oborudovanie i avtomatizatsiia elektricheskogo podvizhnogo sostava. Izd.2., perer. i dop. Moskva, Gosenergoizdat, 1963. 303 p. (MIRA 17:3)

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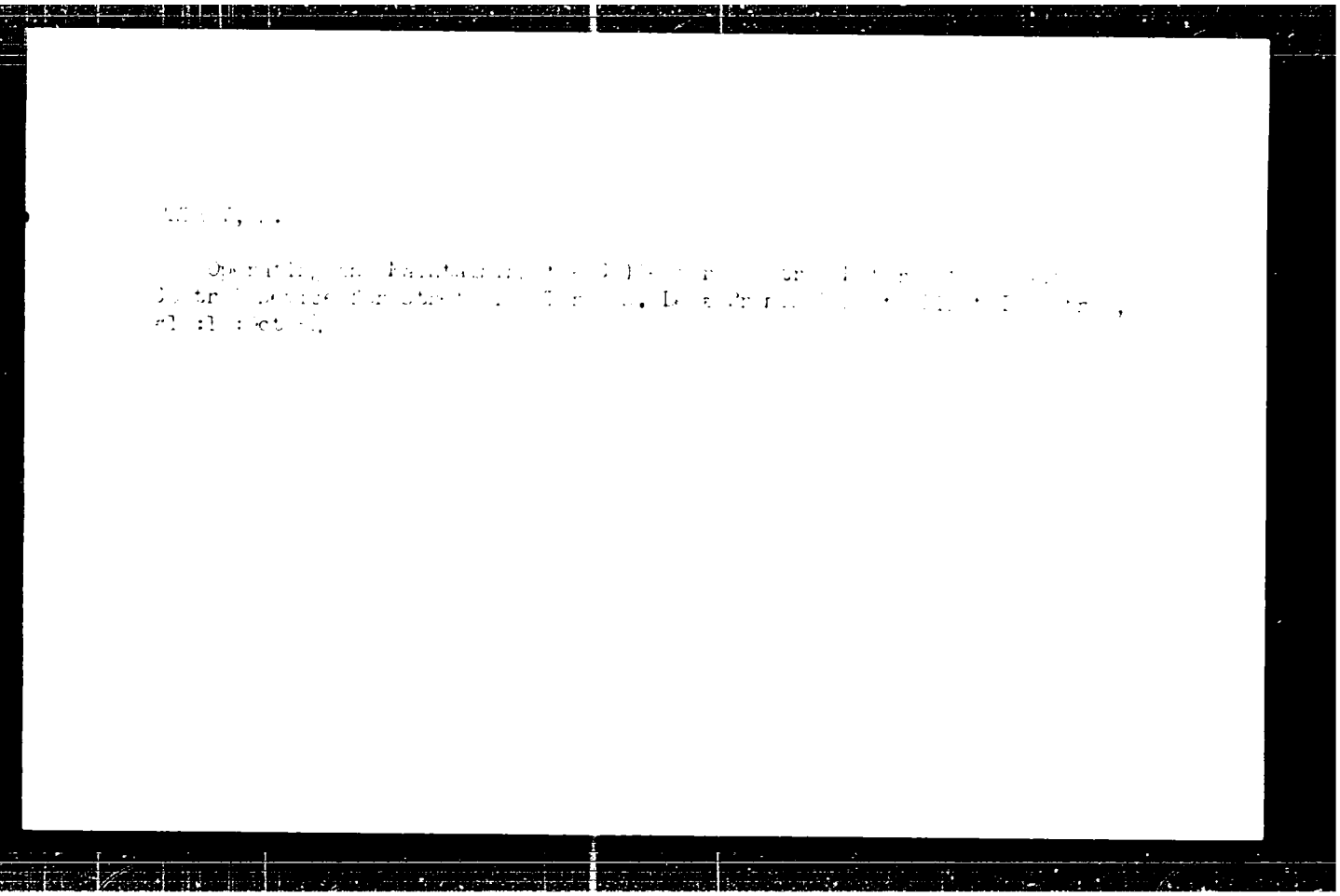
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PETROV, D. (Kuybyshev)

Improve technical control section. Prom.koop.no.9:25 S '56.
(Efficiency, Industrial) (MLRA 9:10)

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NEDEV, B.; PETROV, D.

Case of diverticulum of urinary bladder in extra-saccular hernia. Khirurgiia, Sofia 10 no.3:262 1957.

(BLADDER, diverticula
with sliding hernia (Bul))
(HERNIA, INGUINAL, compl.
bladder diverticulum with sliding hernia (Bul))

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PETROV, D.

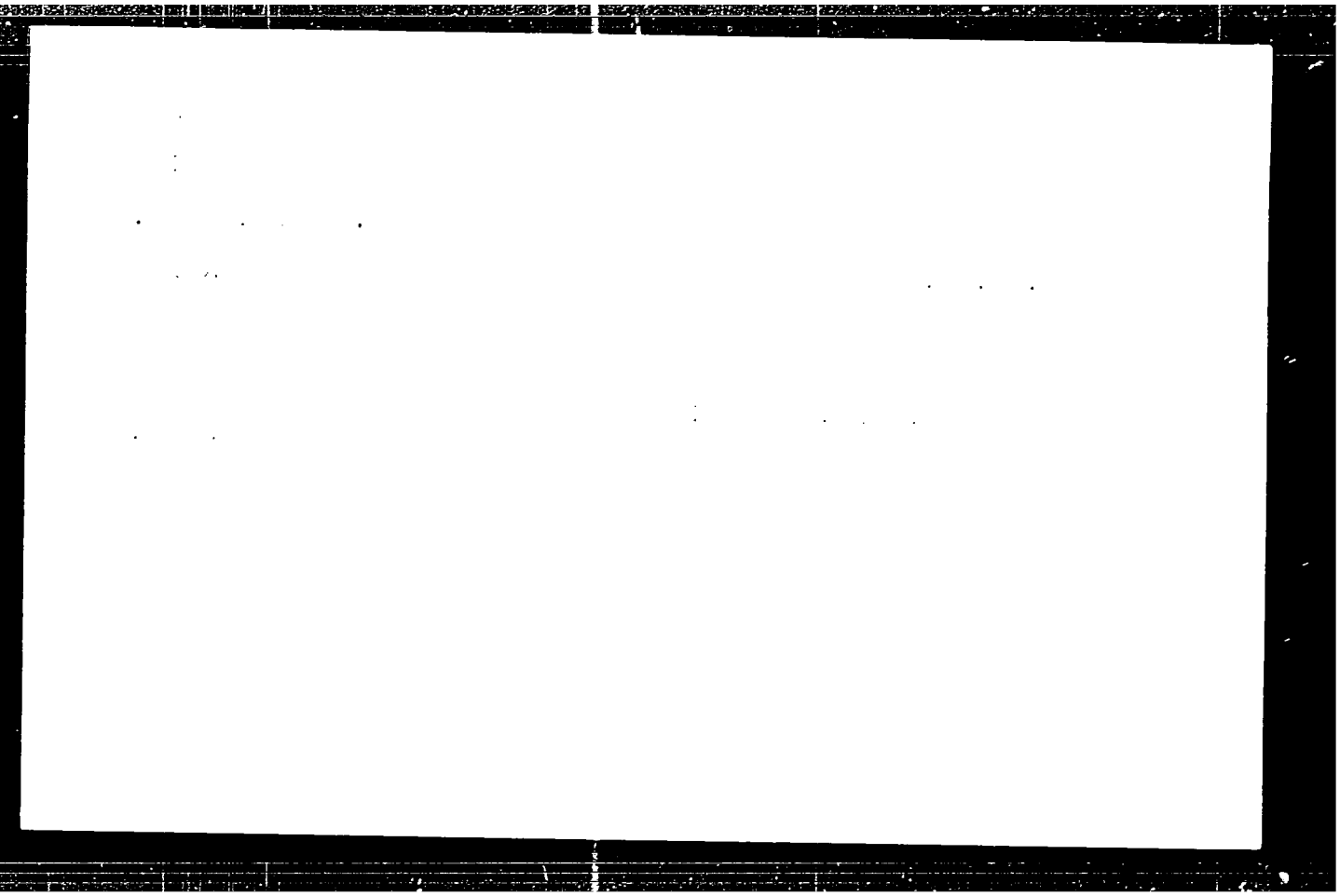
"Some problems related to the growth, structure, and properties of semi-conductive mono-crystals." Tr. from Russian, p. 599

MAGYAR FIZIKAI FOLYOIRAT. (Magyar Tudomanyos Akademia) Budapest, Hungary
Vol. 6, No. 6, 1958.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 6, June 1959.
Uncl.

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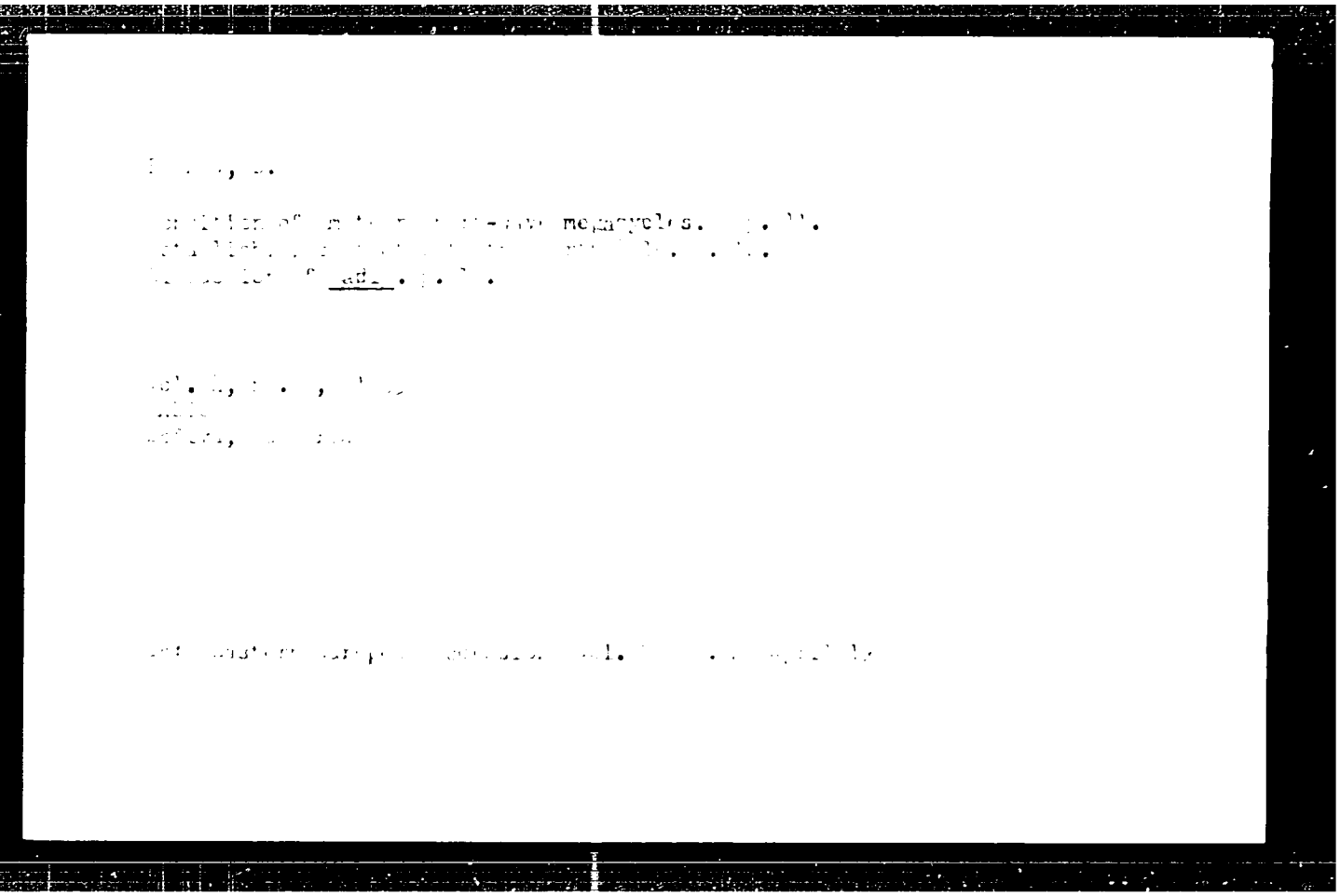
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PETROV, D.

Regional and urban competition in rail telegraphy at Varna.
Radio i televiziia 12 no.8:228 '63.

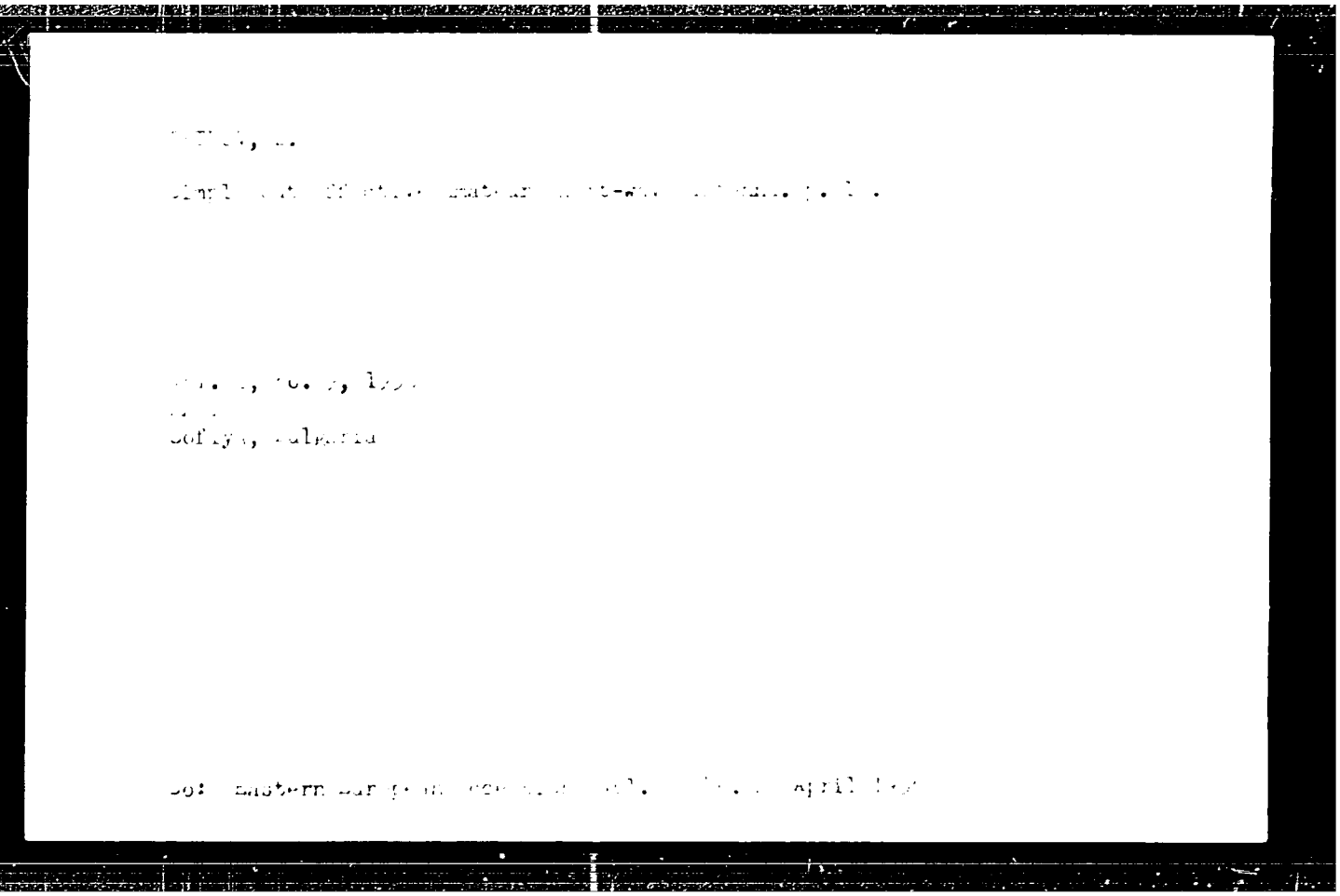
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[illegible]

Some problems related to research on new [illegible]
[illegible]
Vol 10, no. 2, Dec. [illegible]

Soviet Eastern European Accession. Vol 5, no. [illegible], April [illegible]

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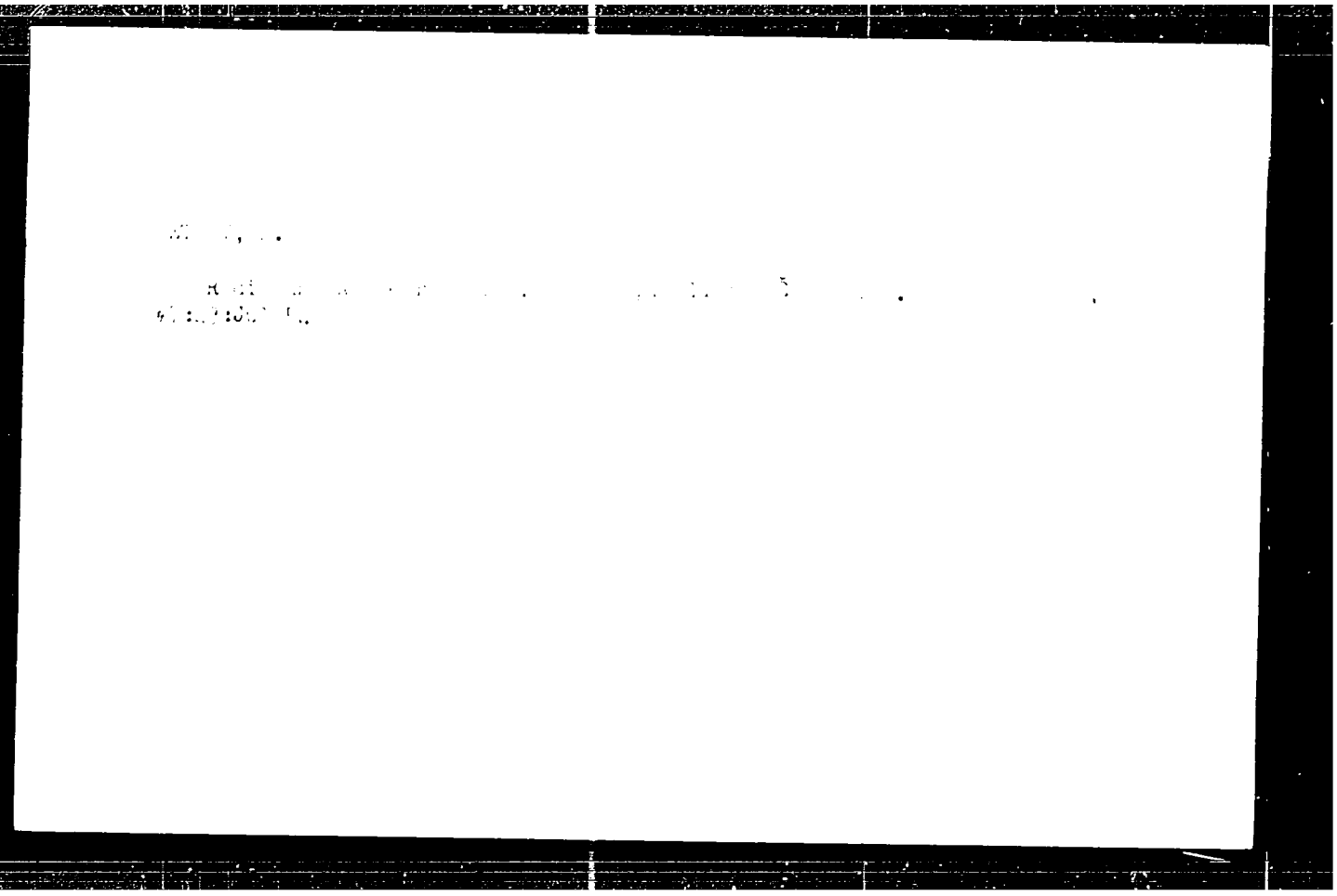
PETROV, D.

PETROV, D. Some interesting short-wave antennas with directional operation.
p. 14. Vol. 5, no. 10, 1956 ELEKTROENERGIIA. Sofiia, Bulgaria

[illegible]

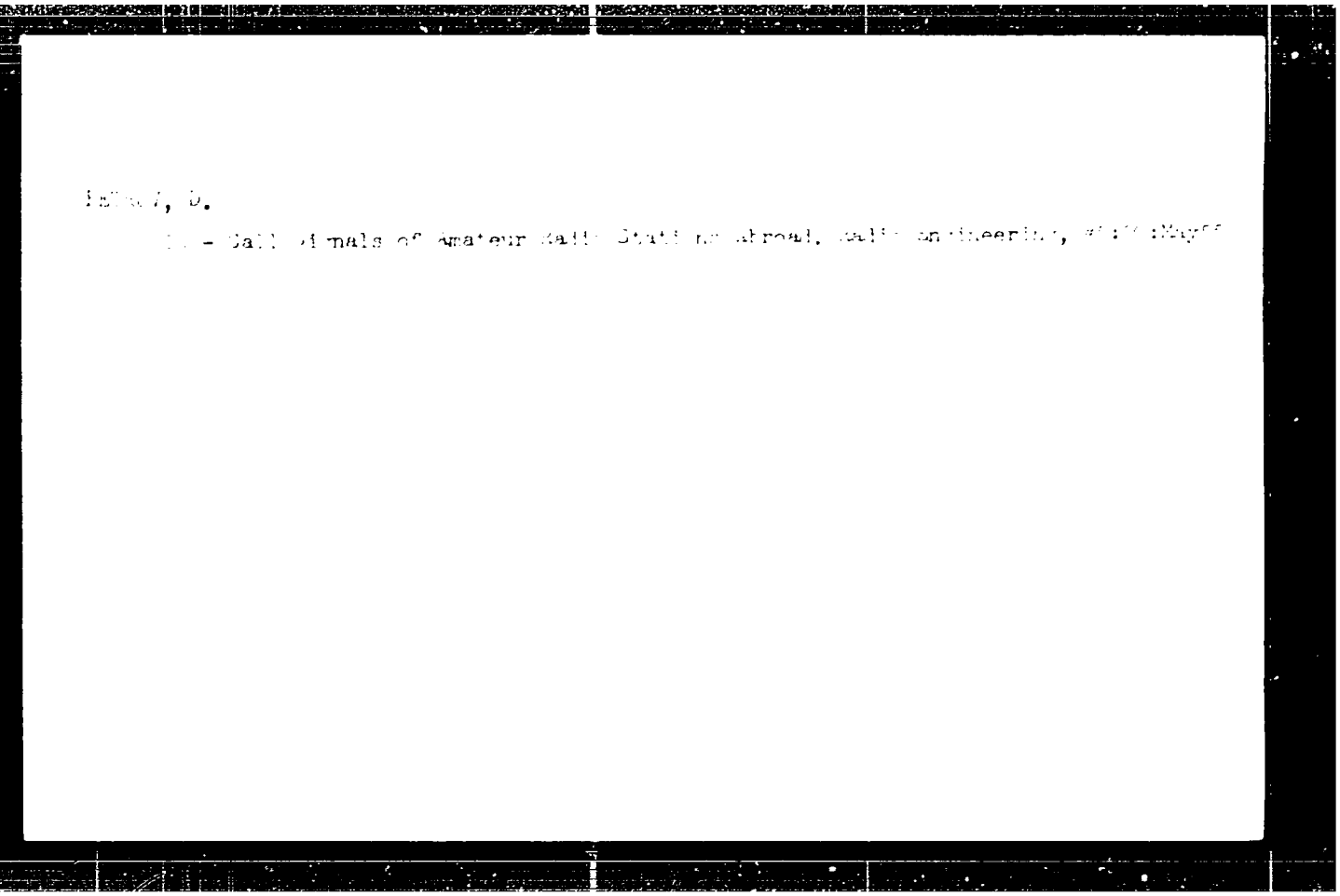
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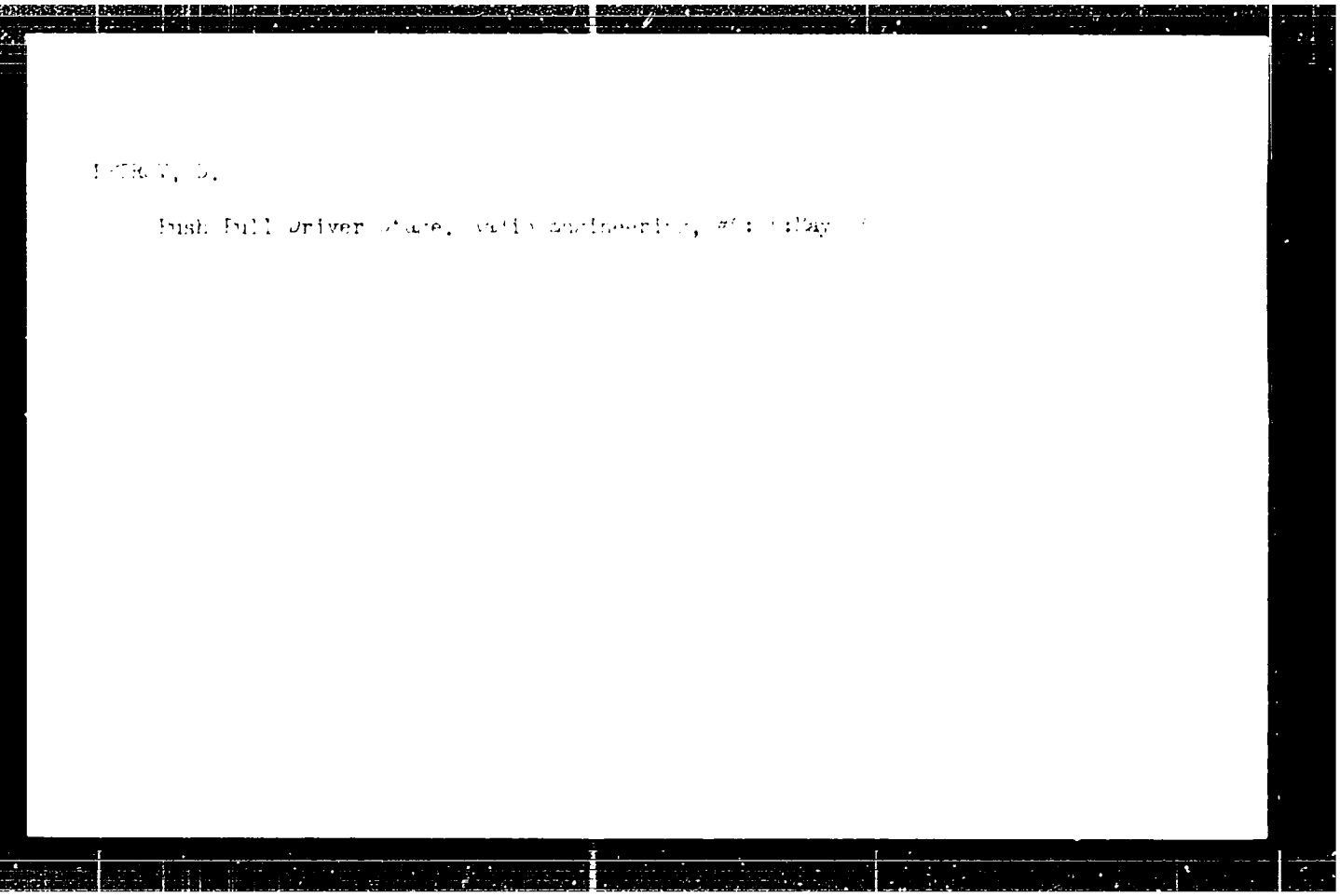
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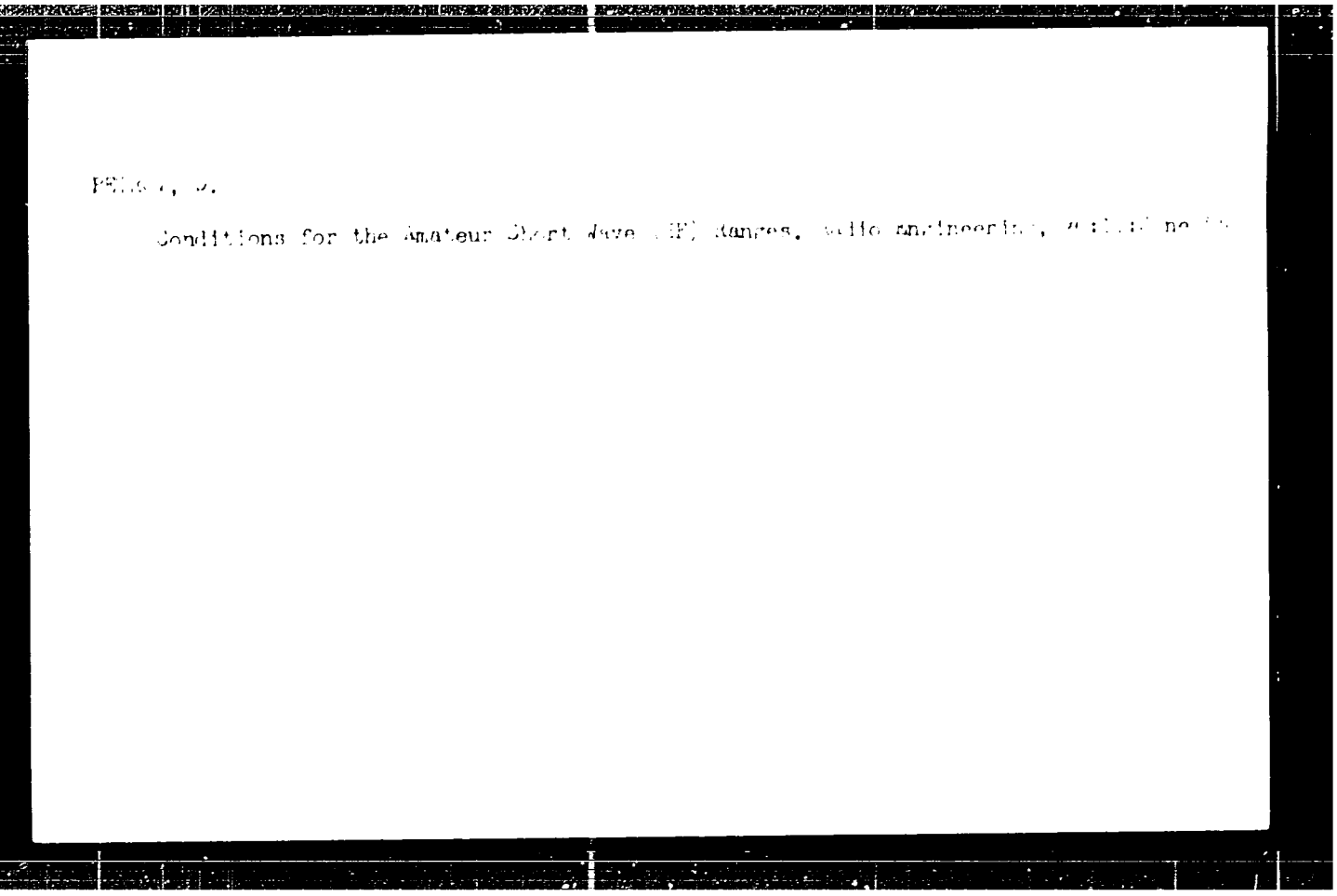
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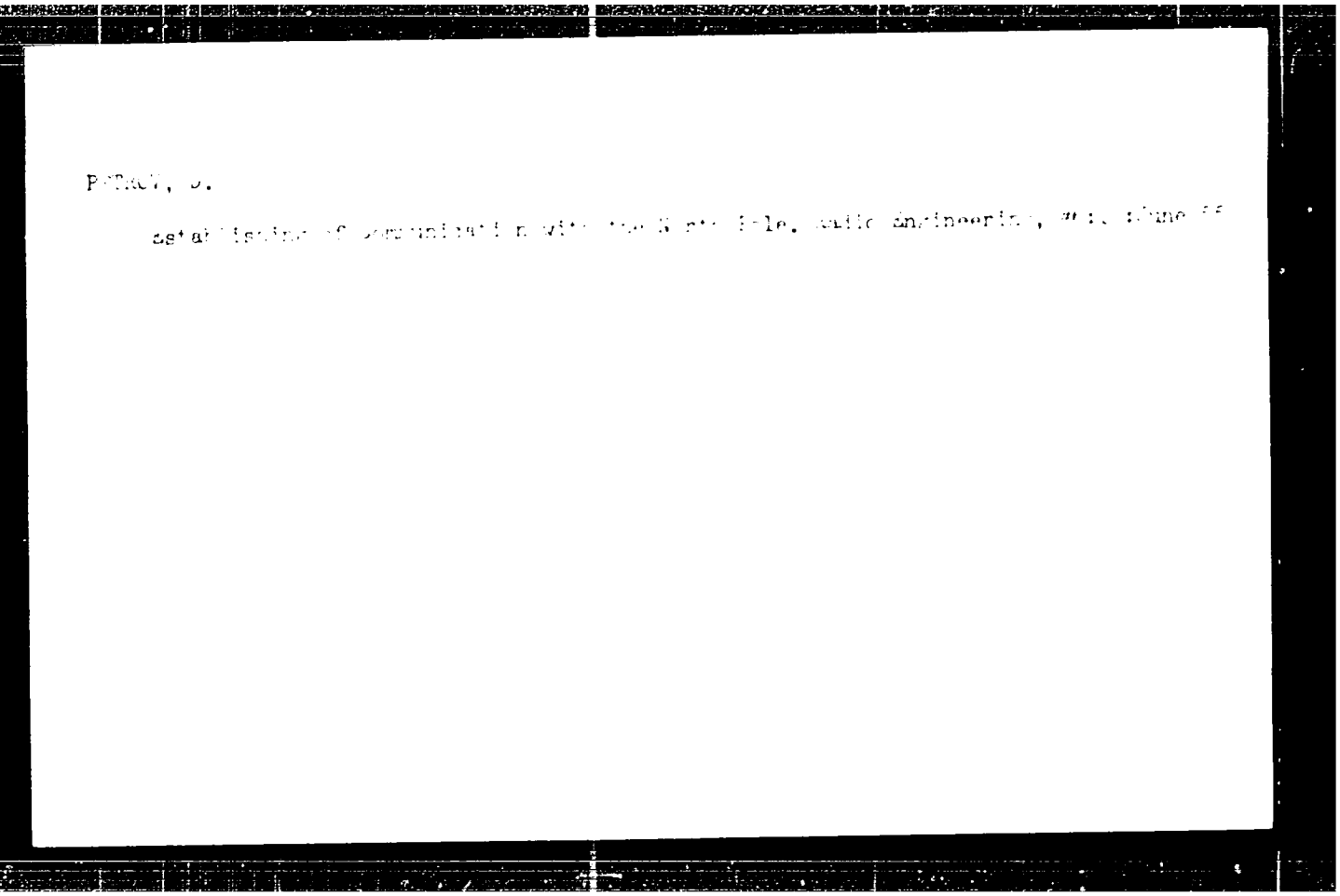
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Conditions for the Amateur Short Wave (HF) Ranges, radio engineering, Published no

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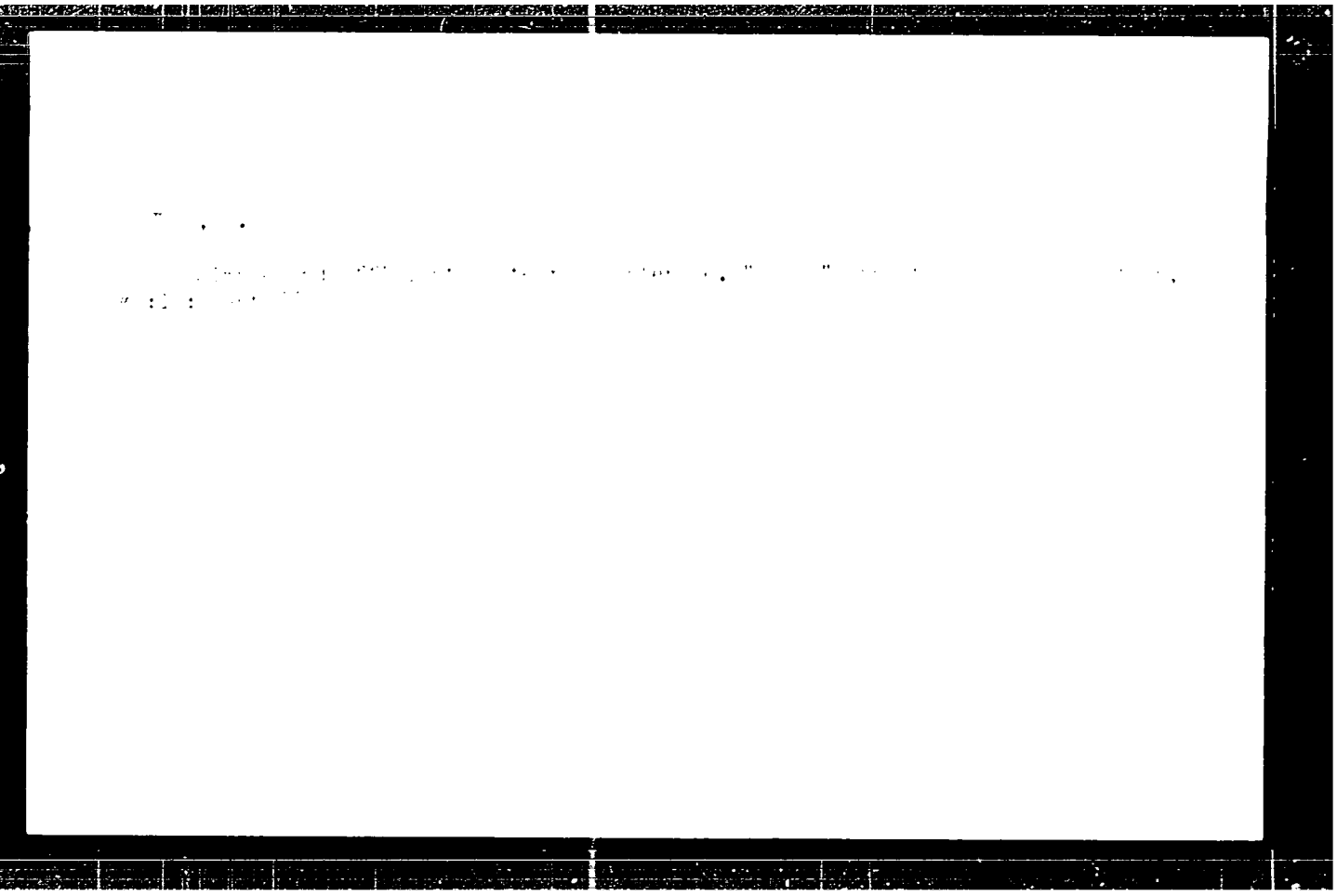


P[illegible], J.

[illegible] Publ. Health Engineering, [illegible]

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PETROV, D.

The OKLAF (Radio Amateur) among the Radio Amateurs of Sofia.
"RADIO" Ministry of Communications, #12:16:Dec. 55

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PETROV, D.

QTC. "RADIO" Ministry of Communications, #12:17:Dec. 55

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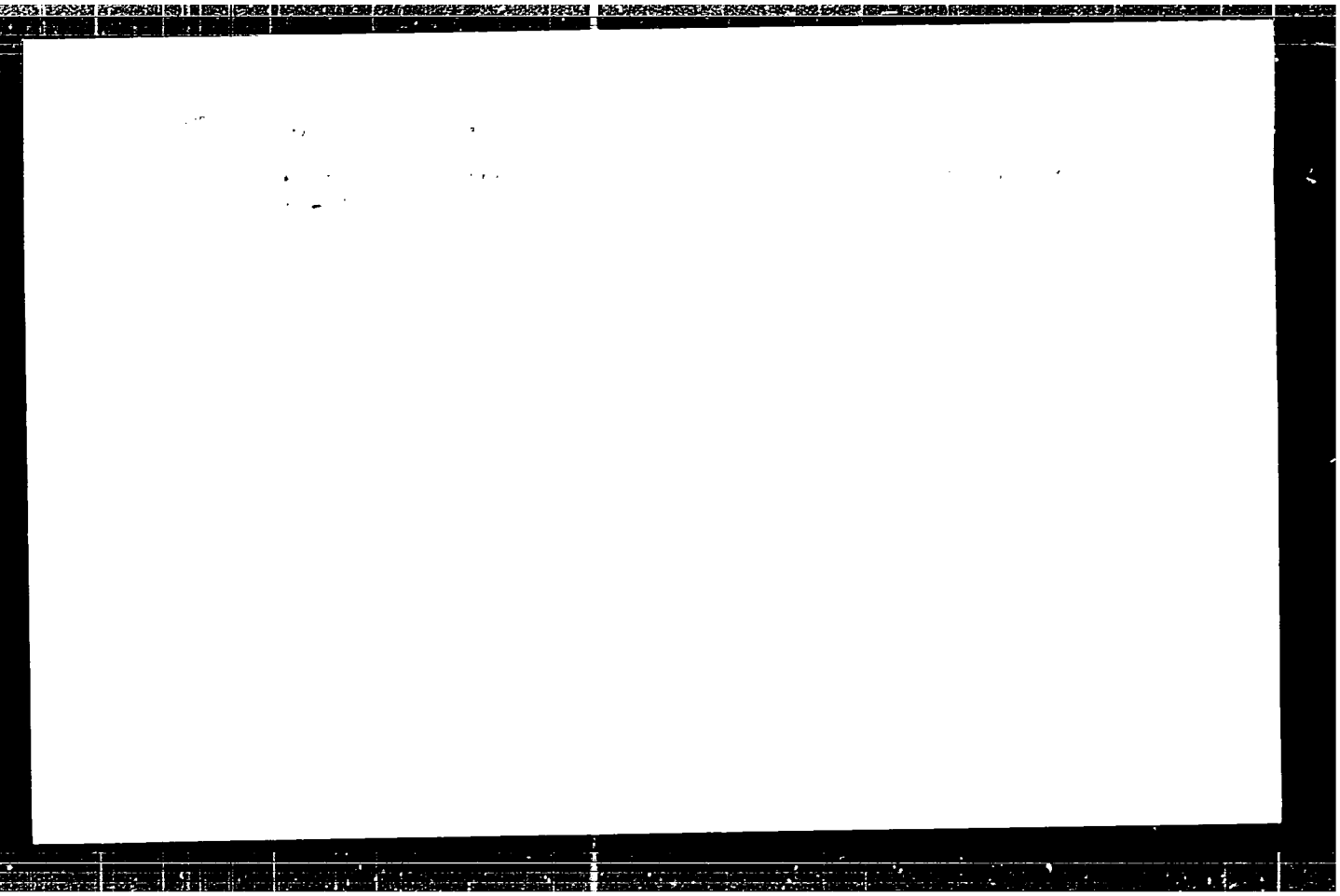
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IVANITSKIY, V.(Kiyev); PETROV, D.(Kiyev)

Let's improve the efficiency of commercial enterprises. Sov. torg. 35 no.9:22-24 S '62. (MIRA 16:2)
(Ukraine—Retail trade)

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IVANOV, I., kand.tekhn.nauk; TIKHONOV, K., kand.tekhn.nauk; PETROV, D. inzh.; SHMYREV, A.

Let us urge the technical reconstruction of railroad transportation. MTO no.4:26-29 Ap '59. (MIRA 12:6)

1. Predsedatel' sektsii elektrifikatsii i energetiki TSentral'nogo pravleniya nauchno-tekhnicheskogo obshchestva zheleznodorozhnogo transporta (for Ivanov). 2. Chleny sektsii ekspluatatsii TSentral'nogo pravleniya nauchno tekhnicheskogo obshchestva zheleznodorozhnogo transporta (for Tikhonov, Petrov). 3. Zamestitel' predsedatelya sektsii signalizatsii i svyazi TSentral'nogo pravleniya nauchno-tekhnicheskogo obshchestva zheleznodorozhnogo transporta (for Shmyrev). (Railroad research)

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PETROV, D.

Short-wave radio station Q T C. p. 20. RADIO. (Ministerstvo na poshtite, telegrafite, telefonite i radioto i Tsentralniia suvet na dobrovolnata organizasiia za sudeistvie na otbranata) Sofiya. Vol. 4, no. 5, 1955

SOURCE: East European Accessions List, (EEAL), Library of Congress Vol.4 , No. 12, December 1955

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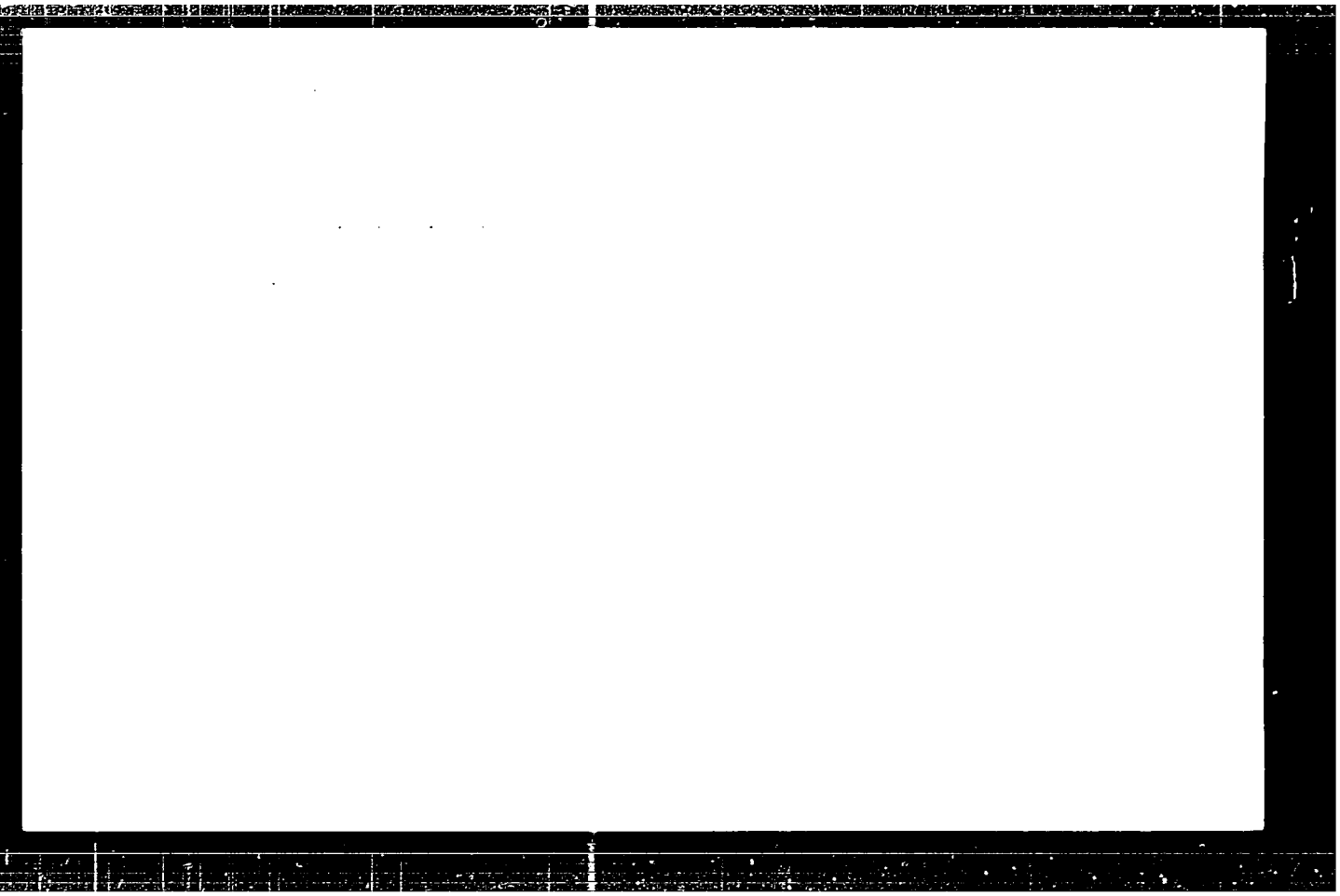
PETROV, D.

Department of short-wave telegraphy. p. 16. RADIO. (MInisterstvo na poshtite, telegrafite, telefonite i radioto i Tsentralniia suvet na dobrovolnata organizatsiia za sudeistvie na otbranata] Sofiya. Vol. 4, no. 5, 1955

SOURCE: East European Accessions List, (EEAL), Library of Congress Vol. 4, No. 12, December 1955

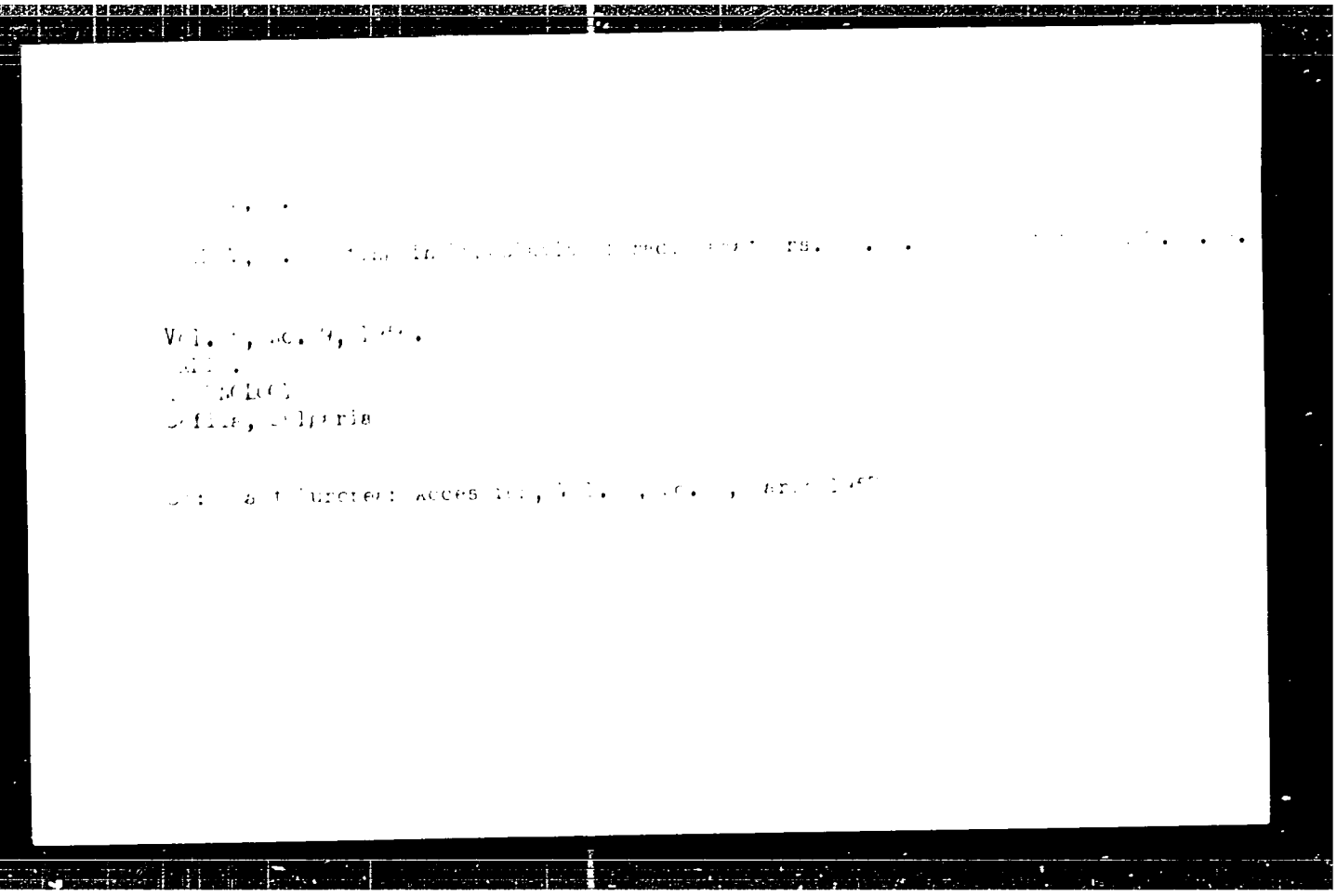
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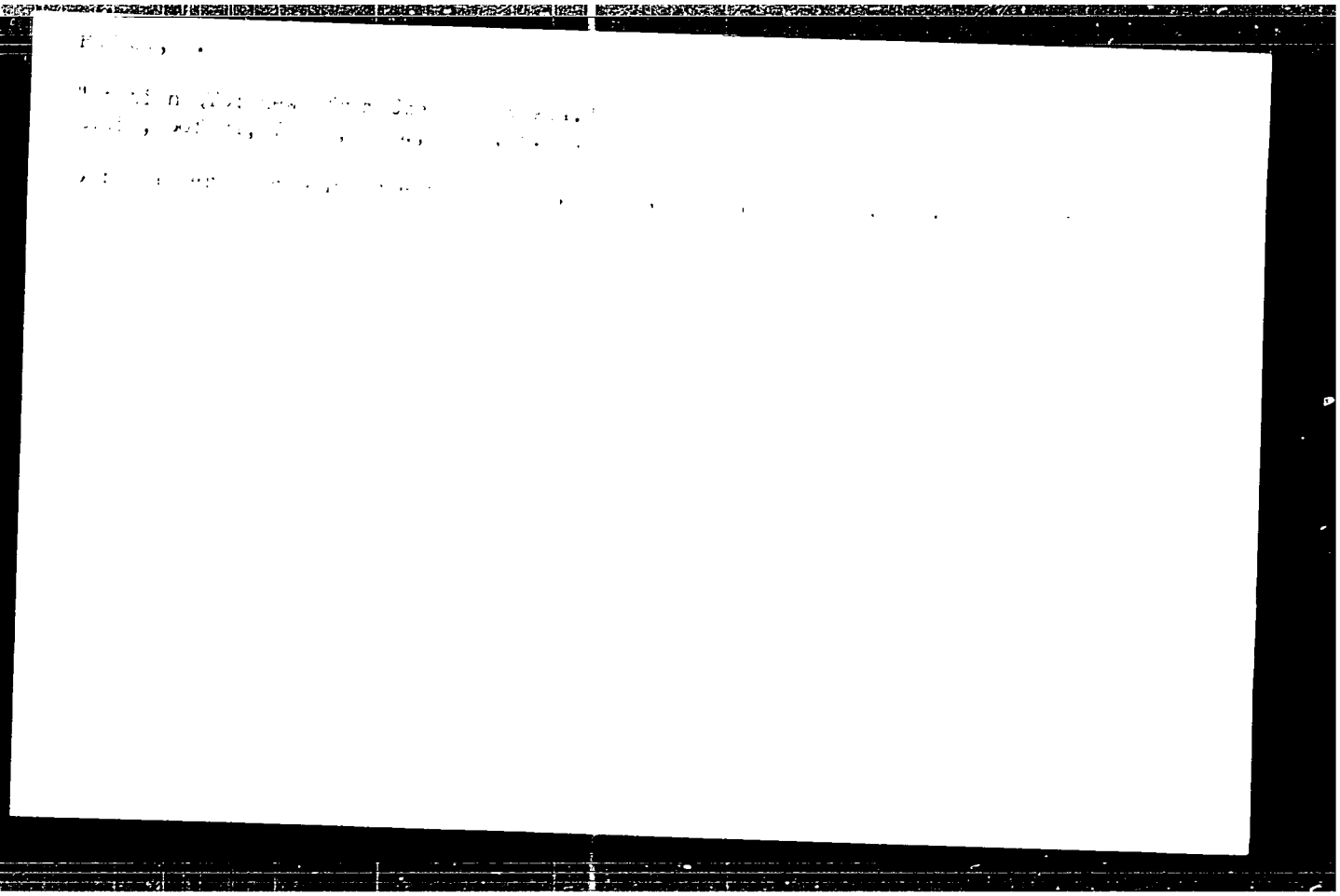
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PETROV, D., redaktor; BODROV, A., tekhnicheskiy redaktor

[Tomorrow in to the field; stories of Communist Youth League committee secretaries of schools for the mechanization of agriculture] Zavtra - v pole; rasskazy sekretarei komitetov VLKSM uchilishch mekhanizatsii sel'skogo khoziaistva. [Moskva] Izd-vo TsK VLKS "Molodaia gvardiia," 1956. 77 p. (MLRA 9:8)
(Communist Youth League)

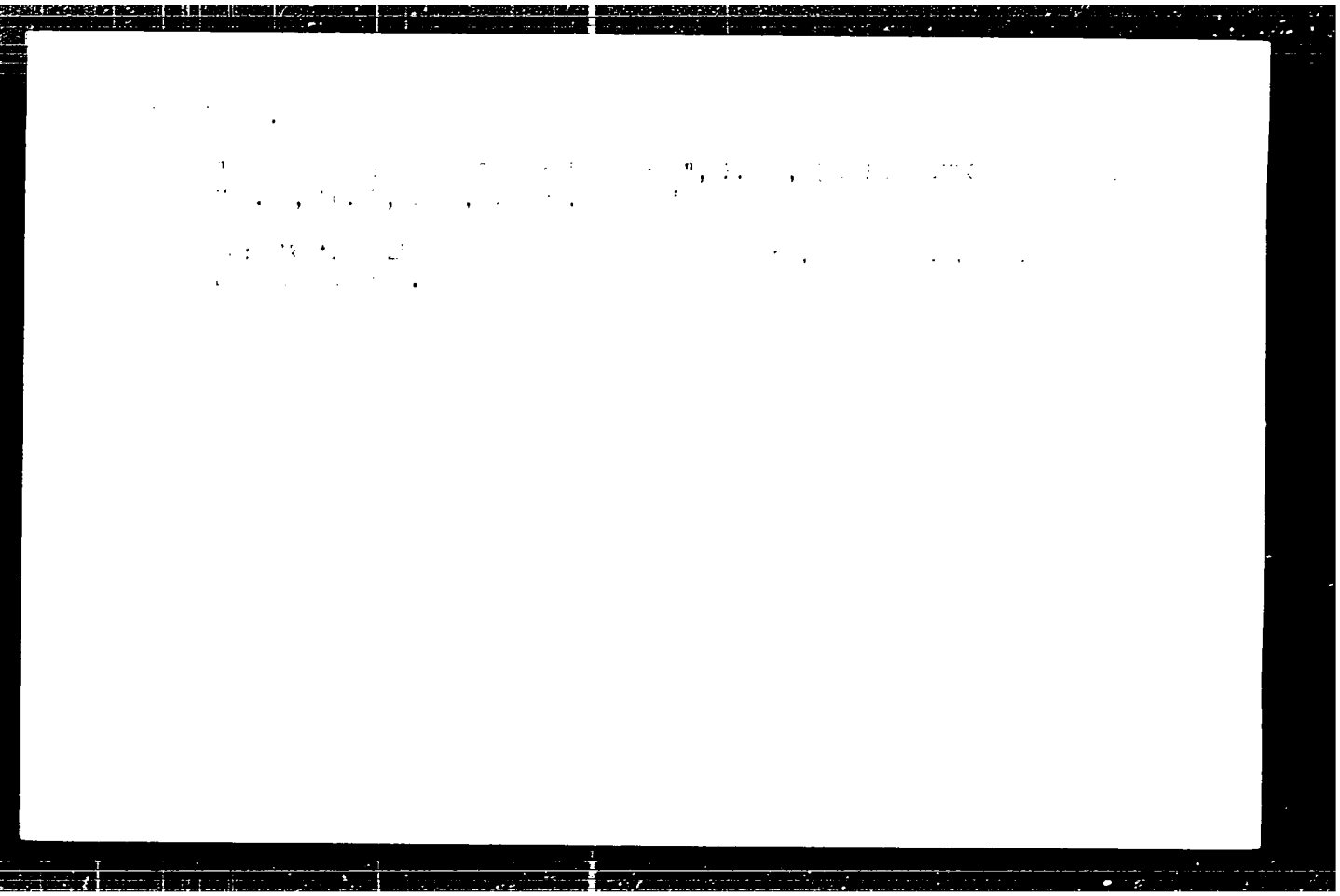
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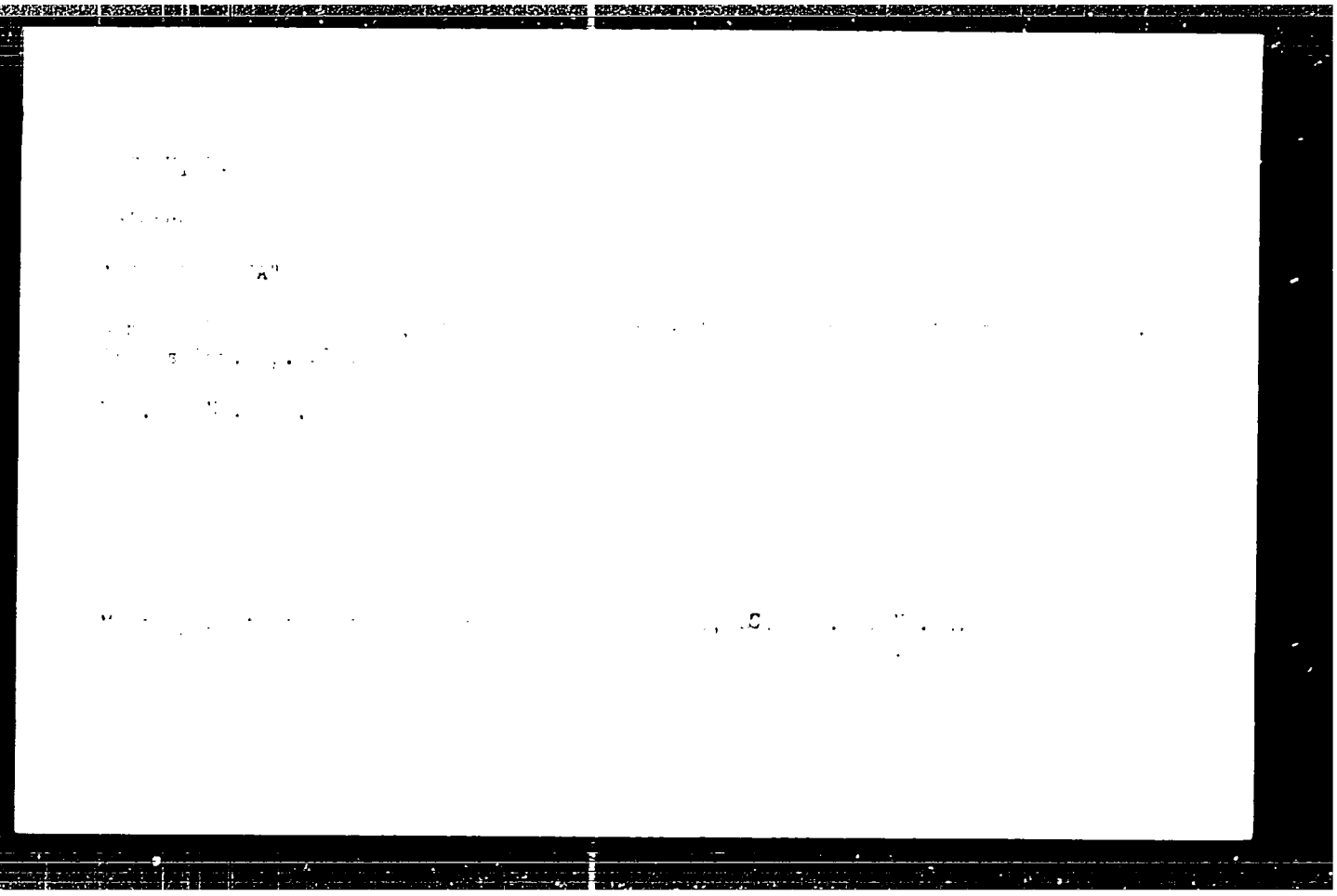
PETROV, D.

Some problems of research on new light-metal alloys. In German. p. 121.
(Acta Technica, Vol. 14, No. 1-2, 1957, Budapest, Hungary

Monthly List of East European Accessions (EEAI) LC, Vol. 7, No. 5, May 1958, Incl.

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PETROV, D.

"New schemes for intermediate railroad stations with economic and operational advantages."

p. 18. (Transportno Delo, Vol. 10, No. 4, 1958, Sofiia, Bulgaria)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 12, Dec 58

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PETROV, [illegible].

New amateur radio station [illegible].
SP9KAG radio station of Polish Boy, [illegible]. Tr. from the Polish. [illegible]

RADIO. Vol. [illegible], [illegible], 1964

Sofiia, Bulgaria

SOURCE: East European Accessions List (EAL) Library of Congress, Vol. [illegible], No. 1, January 1965

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[redacted], P.

"[redacted] kilograms corn produced from a hectare, i. e. [redacted]."
(Kooperativno Zemedelie, Vol. [redacted], Mar. [redacted], Sofia, Bulgaria

SO Monthly List of East European Accessions (EEAI), LC, Vol. [redacted], [redacted], [redacted] for [redacted] 652, Uncl.

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

PETROV, D.

Our experiment in casting basic and rolling bearings for motors 1 MA and AI-5K with BN composition. p. 22.
MASHINIZIRANO ZEMEDELIE. Vol. 7, no. 7, July 1957. Sofiia, Bulgaria

SOURCE: East European Accessions List, (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

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PESHKIN, Il'ya Solomonovich; PETROV, D., redaktor; MOROZOVA, G., tekhnicheskiy redaktor

[Youth pave the ways; Grigorii Pometin, his teachers and comrades] Molodye prokladyvaiut puti; Grigorii Pometun, ego uchitelia i tovarishchi. [Moskva] Izd-vo TsK VLKSM "Molodaia gvardiia," 1956. 95 p. (MLRA 9:10)

(Technical education)
(Founding)
(Pometun, Grigorii Konstantinovich, 1929-)

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PETROV, Dm.

Hardening or lowering your body's resistance. Zdorov'e 2 no.5:
32 My '56. (MLRA 9:8)
(CHILDREN--CARE AND HYGIENE)

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GORODKO, V., nauchnyy sotrudnik (Kiyev); PETROV, D., nauchnyy sotrudnik (Kiyev)

Reduce the cost of the delivery of goods to stores. Sov. torg 35 no.12:20-22 D '61. (MIRA 14:11)
(Delivery of goods)

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PETROV, D., instruktor

The value of an experienced friend. Sel'.mekh. no.3:28-29 '64.
(MIRA 15:3)

1. Rayonnyy komitet Kommunisticheskoy partii Sovetskogo Soyuza, Ashevskiy rayon, Pskovskaya oblast'.
(Agricultural workers)

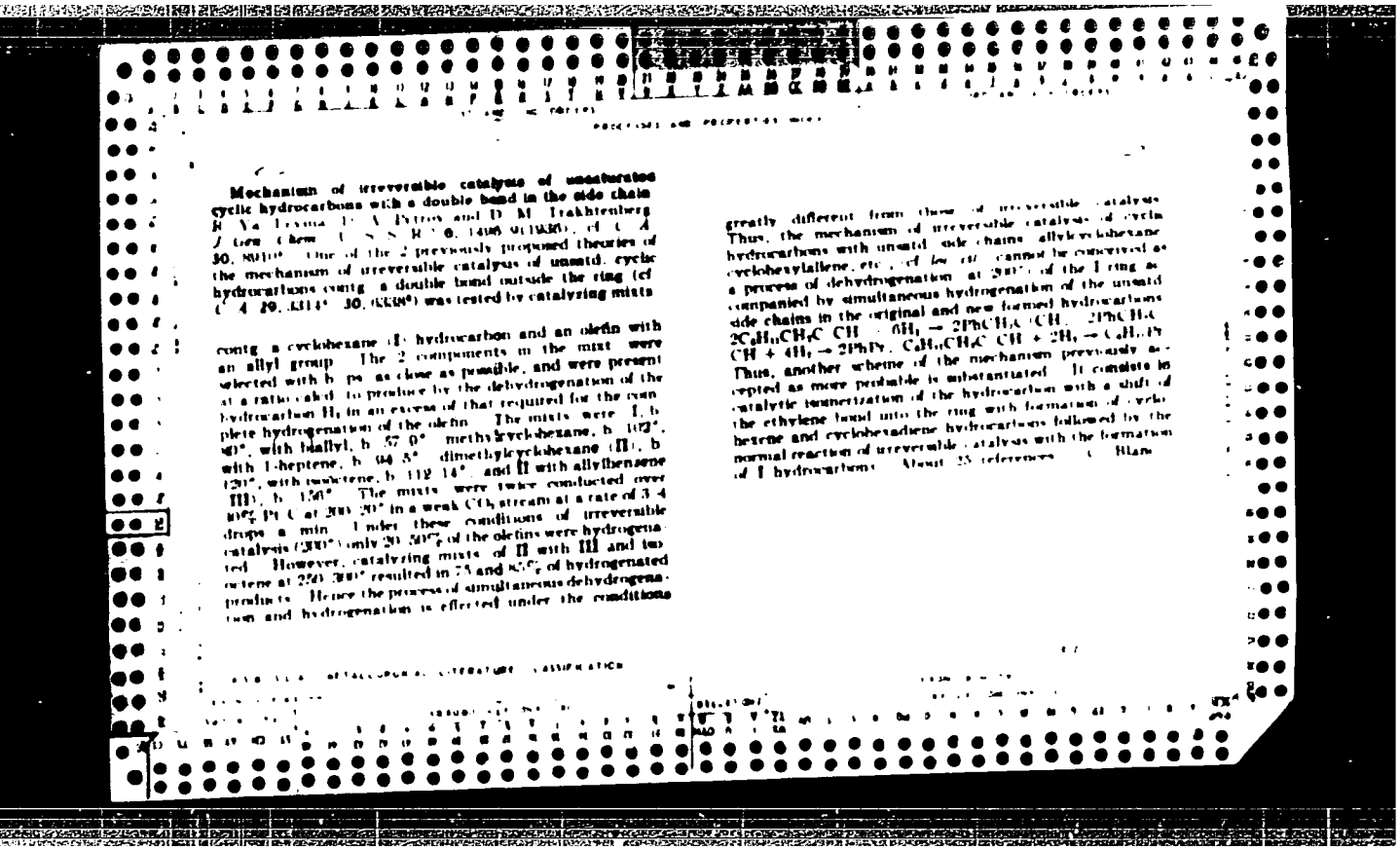
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Casting Department of a Works for Treating Light Alloys. D. A. Petrov. *Legkie Metally* (*Light Metals*), **1938**, (5), 13–17. (In Russian.) Experiences of the work of the Russ electric furnaces at a new factory for treating light alloys are discussed and the chief faults of the furnaces and measures for their correction are described. Conditions of casting large ingots for rolling Alclad, and hollow ingots are discussed. D. N. S.

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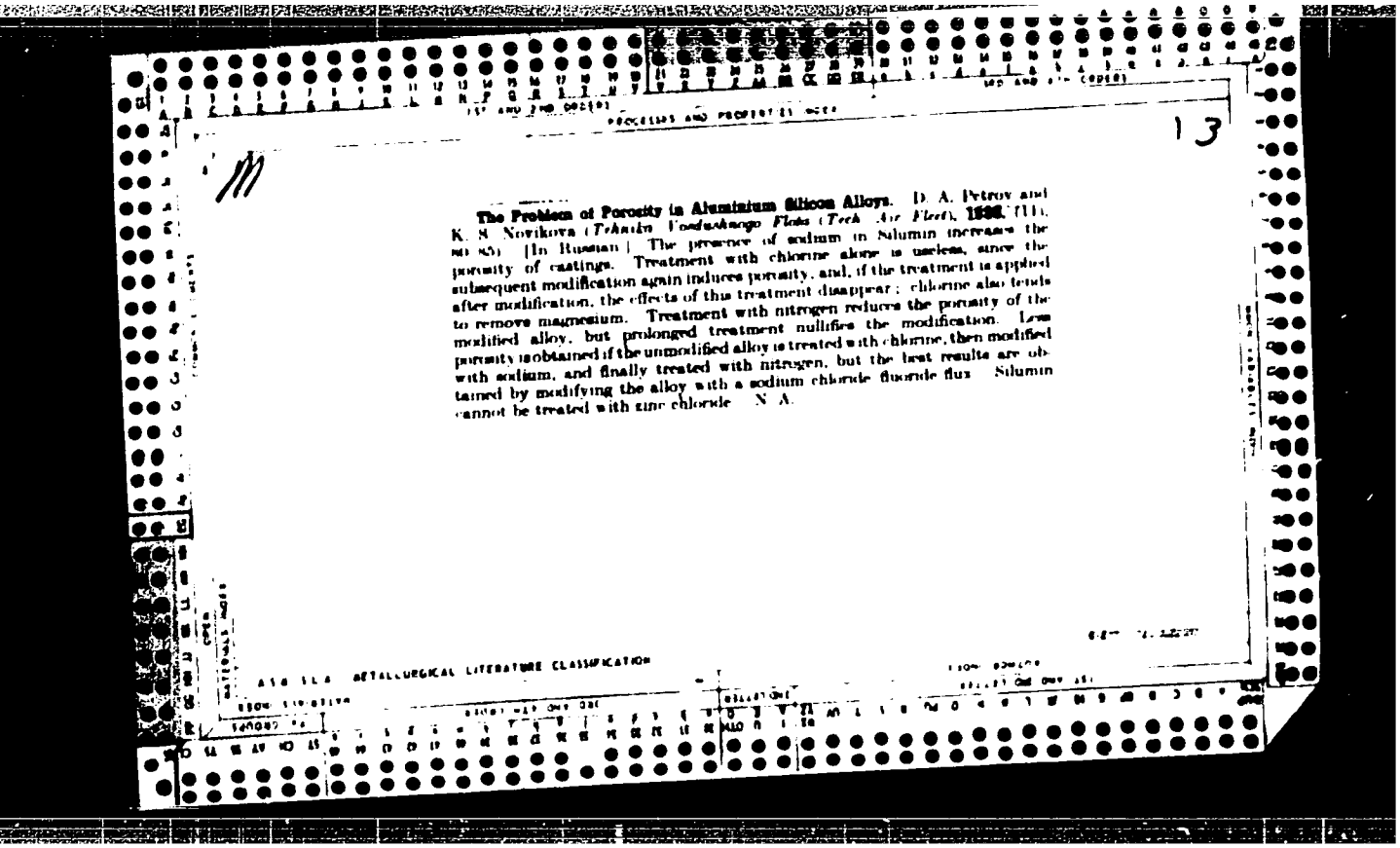
Mechanism of irreversible catalysis of unsaturated cyclic hydrocarbons with a double bond in the side chain

B. Ya. [illegible], I. A. Petrov, and D. M. Rakhlenberg

J. Gen. Chem. U.S.S.R. 9, 1486–91 (1939). cf. *C. A.* 30, 8011[illegible]. One of the 2 previously proposed theories of the mechanism of irreversible catalysis of unsatd. cyclic hydrocarbons contg. a double bond outside the ring (cf. *C. A.* 29, 4314[illegible]; 30, 6688[illegible]) was tested by catalyzing mixts. contg. a cyclohexane (I) hydrocarbon and an olefin with an allyl group. The 2 components in the mixt. were selected with b. pts. as close as possible, and were present at a ratio calcd. to produce by the dehydrogenation of the hydrocarbon II in an excess of that required for the complete hydrogenation of the olefin. The mixts. were I, b. 80°, with diallyl, b. 57.0°; methylcyclohexane, b. 102°, with 1-heptene, b. 94.5°; dimethylcyclohexane (II), b. 120°, with camphene, b. 112.14°; and II with allylbenzene (III), b. 156°. The mixts. were twice conducted over Ni-Cr at 300–20° in a weak CO_2 stream at a rate of 3–4 drops a min. Under these conditions of irreversible catalysis (300°) only 20–30% of the olefins were hydrogenated. However, catalyzing mixts. of II with III and camphene at 250–300° resulted in 75 and 85% of hydrogenated products. Hence the process of simultaneous dehydrogenation and hydrogenation is effected under the conditions greatly different from those of irreversible catalysis. Thus, the mechanism of irreversible catalysis of cyclic hydrocarbons with unsatd. side chains, allylcyclohexane, cyclohexylallene, etc., cf. *loc. cit.*, cannot be conceived as a process of dehydrogenation at [illegible] of the I ring accompanied by simultaneous hydrogenation of the unsatd. side chains in the original and new formed hydrocarbons. $2C_6H_{11}CH_2C{\equiv}CH \rightarrow 6H_2 \rightarrow 2PhCH_2{\cdot}CH_2{\cdot}CH_3$; $2C_6H_{11}CH_2C{\equiv}CH + 2H_2 \rightarrow C_6H_{11}CH_2C{\equiv}CH + 4H_2 \rightarrow 2PhPr$. $C_6H_{11}CH_2C{\equiv}CH + 2H_2 \rightarrow C_6H_{11}Pr$. Thus, another scheme of the mechanism previously accepted as more probable is substantiated. It consists in catalytic isomerization of the hydrocarbon with a shift of the ethylene bond into the ring with formation of cyclohexene and cyclohexadiene hydrocarbons followed by the normal reaction of irreversible catalysis with the formation of I hydrocarbons. About 25 references. [illegible]

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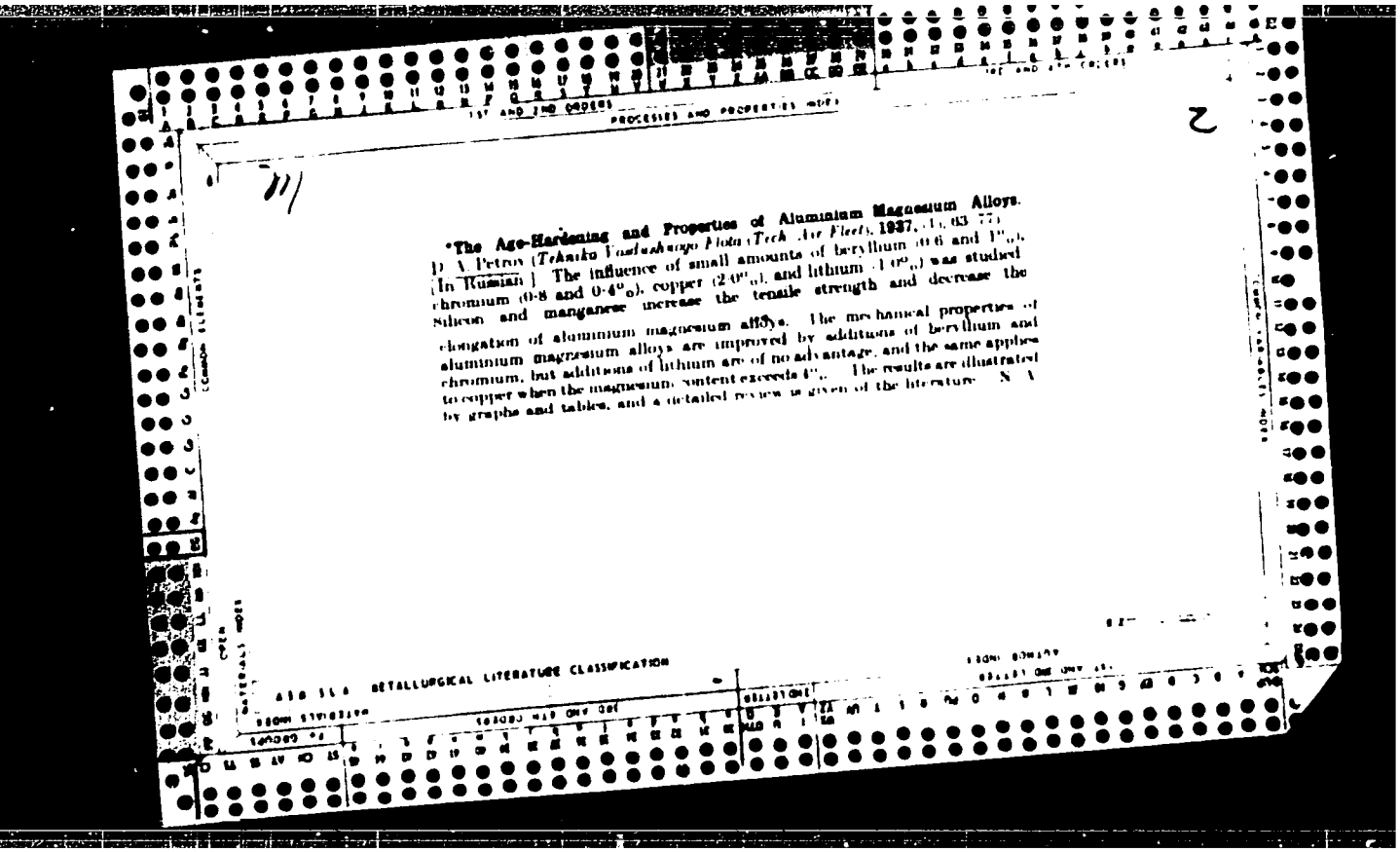
13

The Problem of Porosity in Aluminium Silicon Alloys. D. A. Petrov and K. S. Novikova (*Tekhnika Vozdushnogo Flota* (*Tech. Air Fleet*), 1938, (11), [illegible]). [In Russian.] The presence of sodium in Silumin increases the porosity of castings. Treatment with chlorine alone is useless, since the subsequent modification again induces porosity, and, if the treatment is applied after modification, the effects of this treatment disappear; chlorine also tends to remove magnesium. Treatment with nitrogen reduces the porosity of the modified alloy, but prolonged treatment nullifies the modification. Less porosity is obtained if the unmodified alloy is treated with chlorine, then modified with sodium, and finally treated with nitrogen, but the best results are obtained by modifying the alloy with a sodium chloride fluoride flux. Silumin cannot be treated with zinc chloride. N. A.

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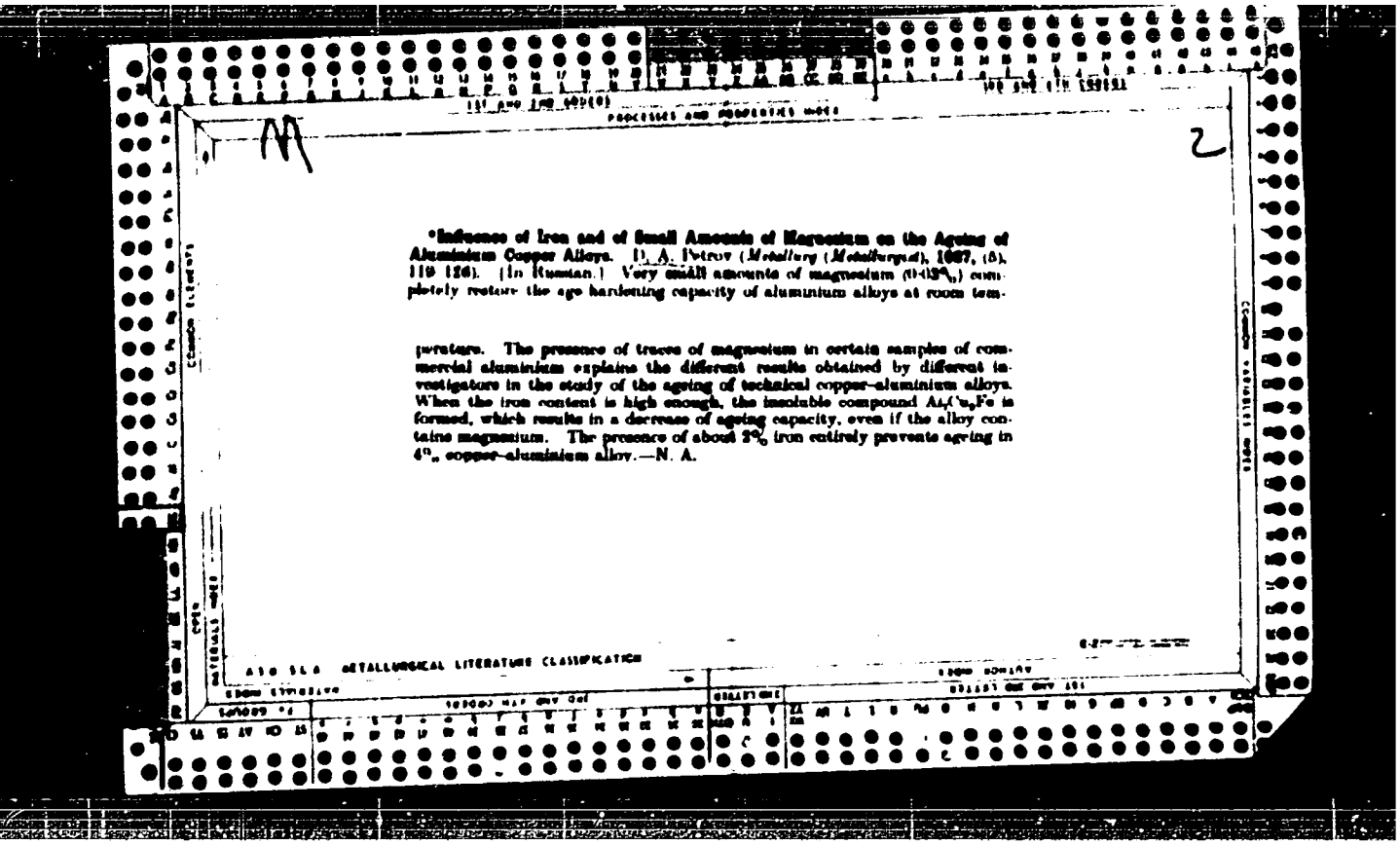
*The Age-Hardening and Properties of Aluminium Magnesium Alloys.

D. A. Petrov (*Trudy Vsesoyuznogo Nauch.-Issled. Inst. Tekh. Aviatsionnykh Materialov*, 1937, No. 83, 77–[illegible]). [In Russian.] The influence of small amounts of beryllium (0·6 and 1·0%), chromium (0·8 and 0·4%), copper (2·0%), and lithium (1·0%) was studied. Silicon and manganese increase the tensile strength and decrease the elongation of aluminium magnesium alloys. The mechanical properties of aluminium magnesium alloys are improved by additions of beryllium and chromium, but additions of lithium are of no advantage, and the same applies to copper when the magnesium content exceeds 4%. The results are illustrated by graphs and tables, and a detailed review is given of the literature. N. A.

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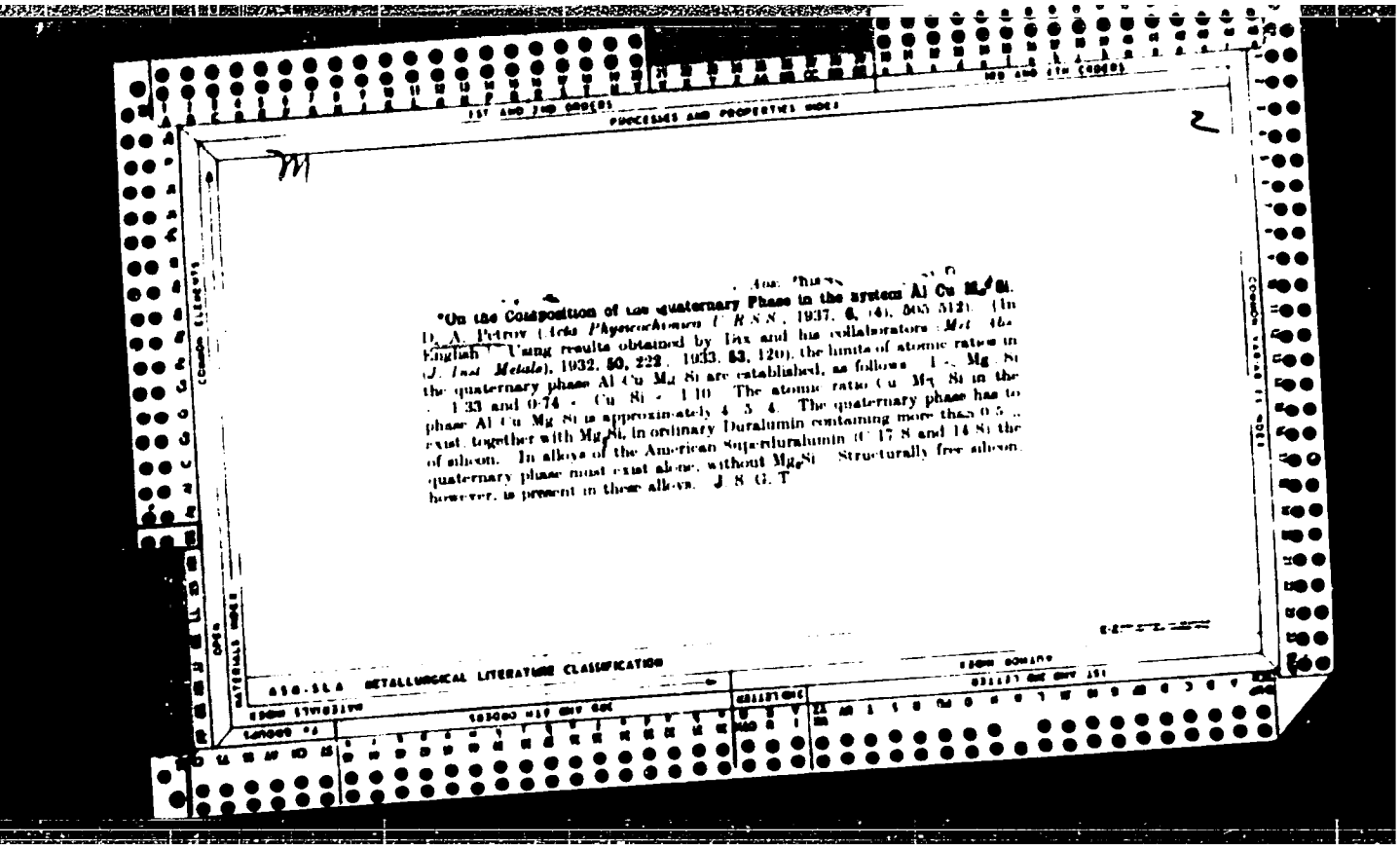
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Influence of Iron and of Small Amounts of Magnesium on the Ageing of Aluminium Copper Alloys. [1] A. Petrov (*Metallurg* (*Metallurgist*), 1937, (5), 119–126). [In Russian.] Very small amounts of magnesium (0·01–2%) completely restore the age hardening capacity of aluminium alloys at room temperature. The presence of traces of magnesium in certain samples of commercial aluminium explains the different results obtained by different investigators in the study of the ageing of technical copper–aluminium alloys. When the iron content is high enough, the insoluble compound Al_9Fe is formed, which results in a decrease of ageing capacity, even if the alloy contains magnesium. The presence of about 2% iron entirely prevents ageing in 4% copper–aluminium alloy.—N. A.

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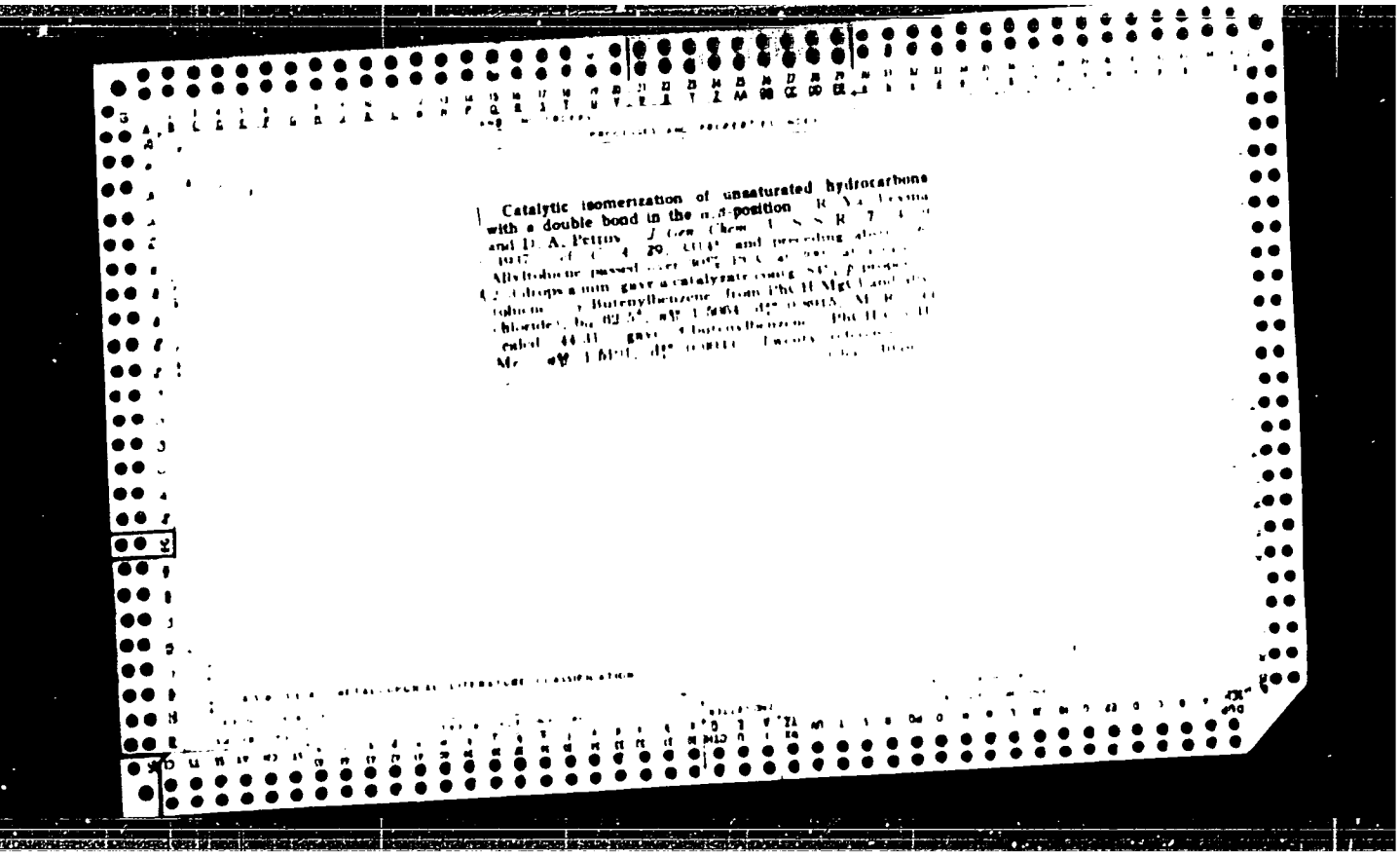
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"On the Composition of the quaternary Phase in the system Al Cu Mg_2Si.
D. A. Petrov (Acta *Physicochimica U.R.S.S.*, 1937, **6**, (4), 505-512). (In English.) Using results obtained by Fix and his collaborators (*Met. Abs. J. Inst. Metals*), 1932, **50**, 222; 1933, **53**, 120), the limits of atomic ratios in the quaternary phase Al Cu Mg_2Si are established, as follows: Cu : Mg 1·33 and 0·74; Cu : Si = 1·10. The atomic ratio Cu : Mg : Si in the phase Al Cu Mg_2Si is approximately 4 : 5 : 4. The quaternary phase has to exist together with Mg_2Si, in ordinary Duralumin containing more than 0·5% of silicon. In alloys of the American Superduralumin (0·17·8 and 14·8) the quaternary phase must exist alone, without Mg_2Si. Structurally free silicon, however, is present in these alloys. J. S. G. T.

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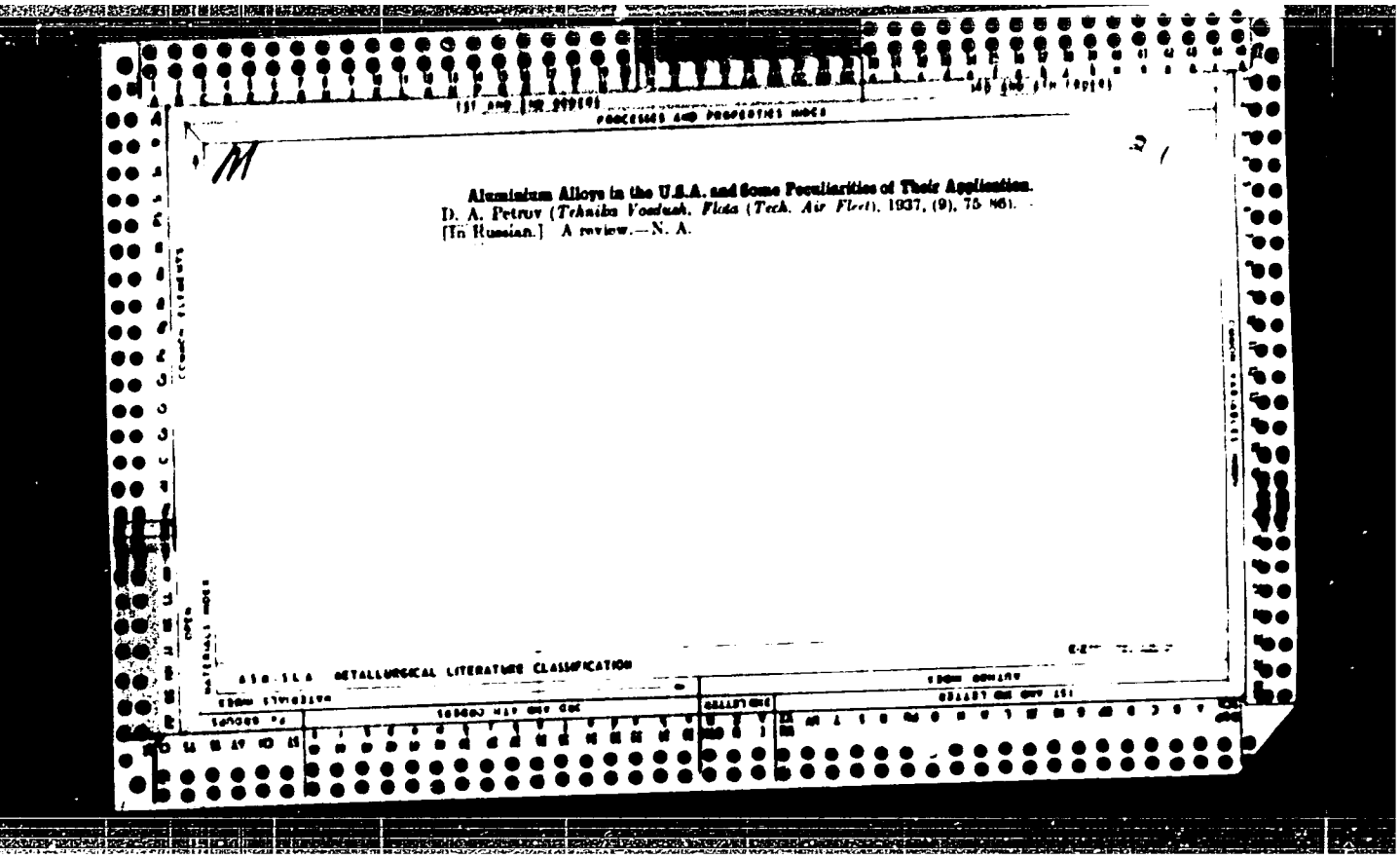


Catalytic isomerization of unsaturated hydrocarbons with a double bond in the α,β-position

and D. A. Petrov

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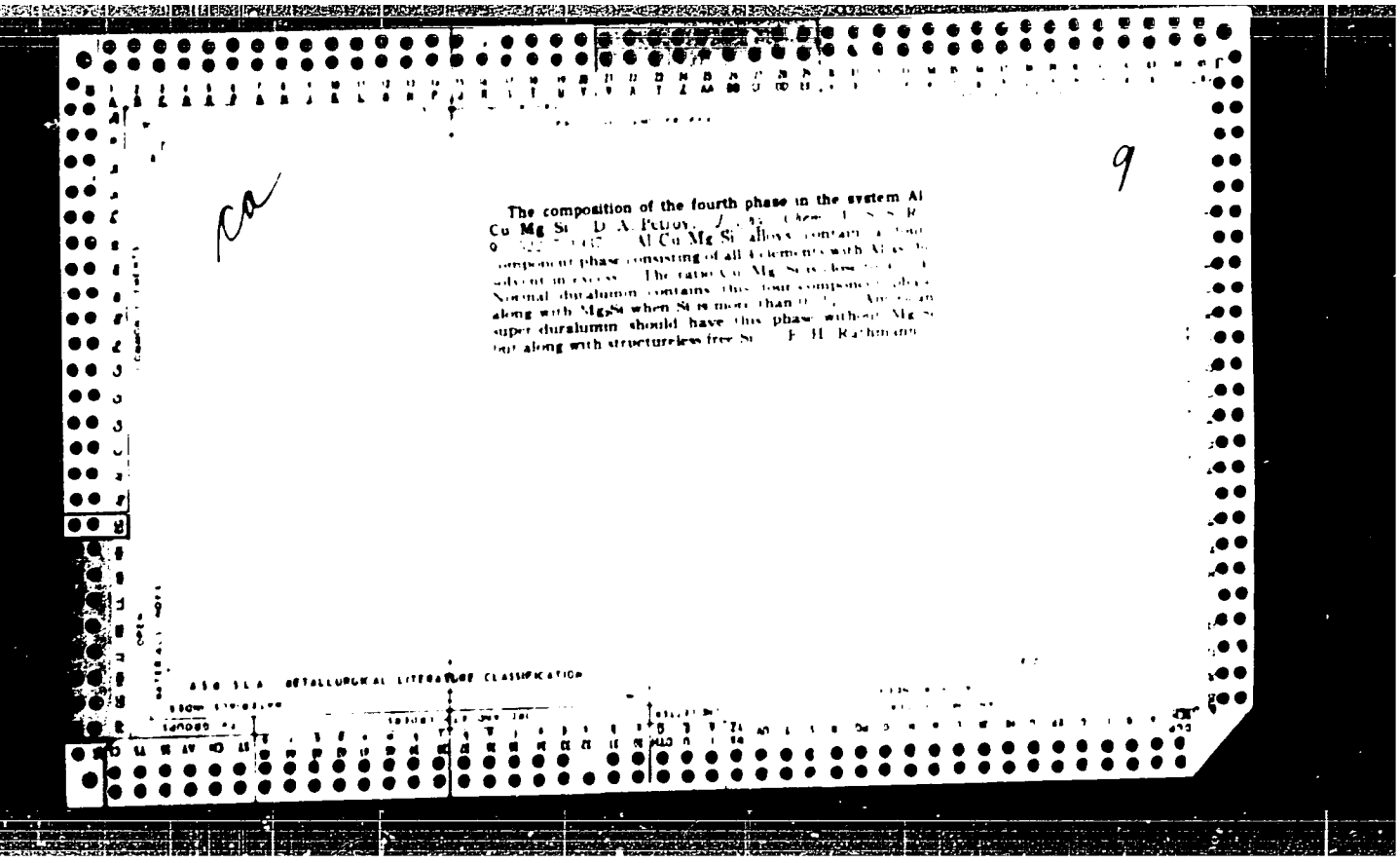
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Aluminium Alloys in the U.S.A. and Some Peculiarities of Their Application.
D. A. Petrov (*Tekniko Vozdush. Flota* (*Tech. Air Fleet*), 1937, (9), 75 pp.).
[In Russian.] A review.—N. A.

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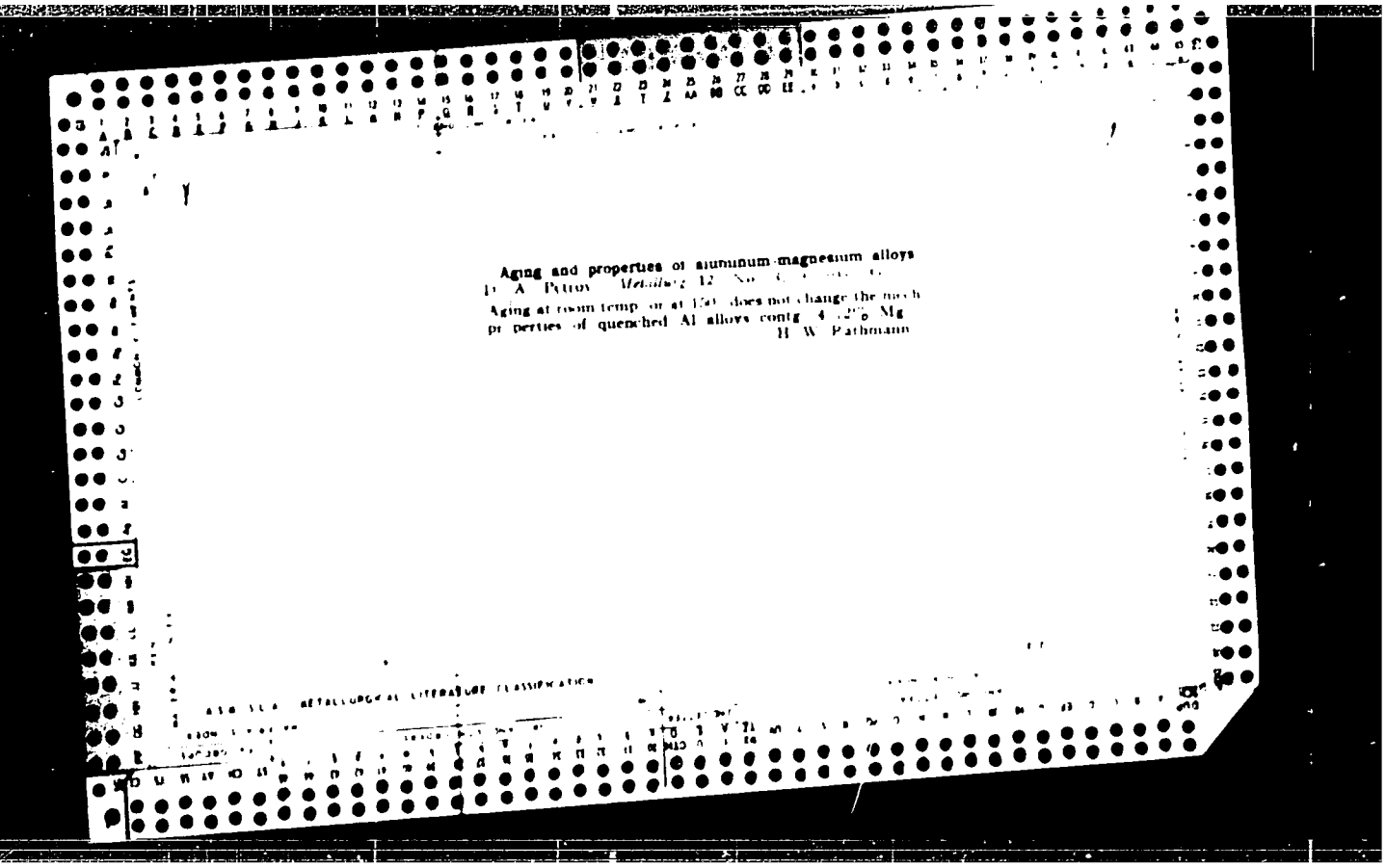


The composition of the fourth phase in the system Al Cu Mg Si D. A. Petrov, J. ... Al Cu Mg Si alloys contain a four component phase consisting of all ... solvent in excess. The ratio Cu Mg Si ... Normal duralumin contains this four component ... along with Mg_2Si when Si is more than ... super duralumin should have this phase without Mg ... four along with structureless free Si. F. H. Rathmann

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

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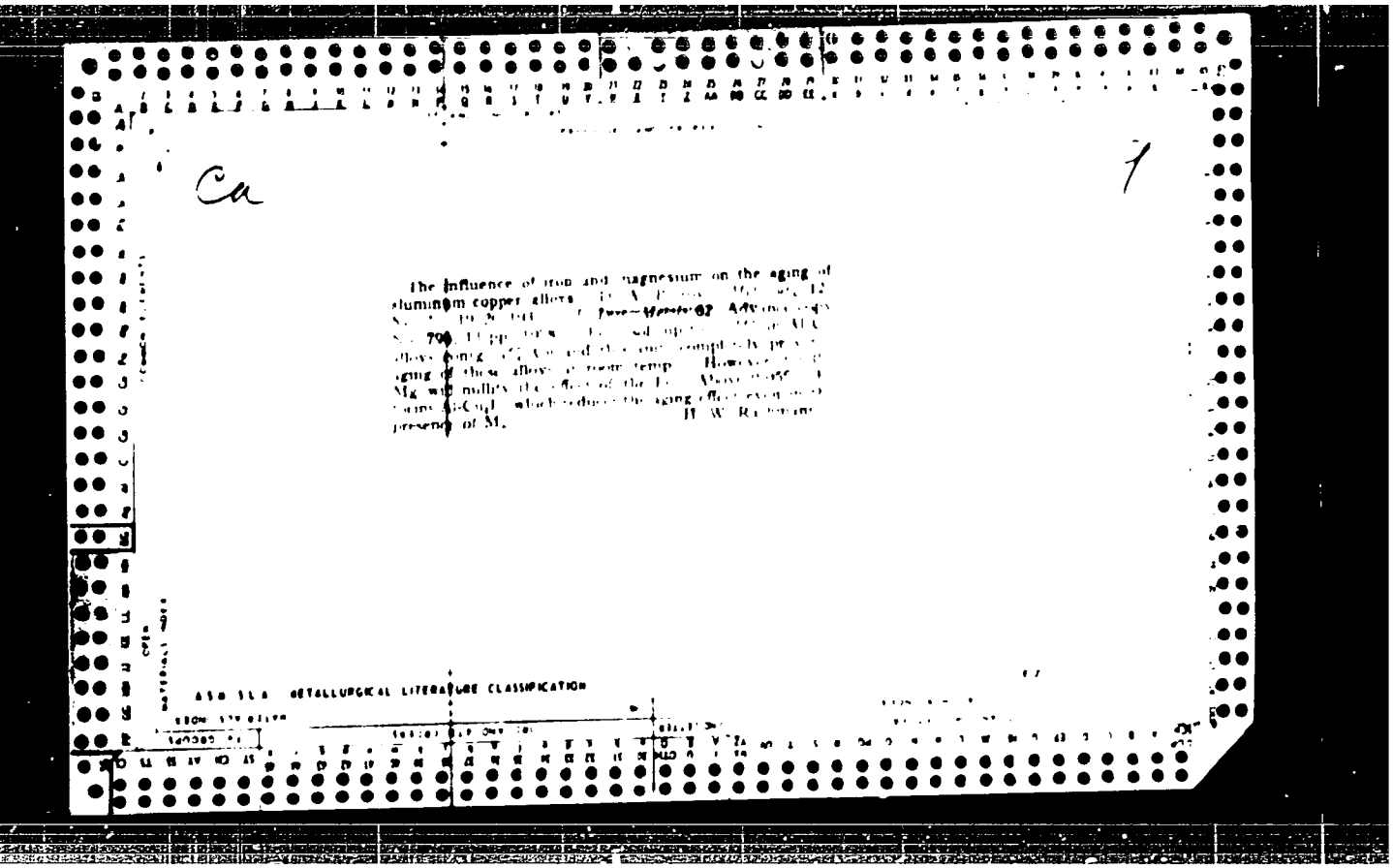


Aging and properties of aluminum-magnesium alloys
I. A. Petrov *Metallurg* 12 No. [illegible]

Aging at room temp. or at 150° does not change the mech. properties of quenched Al alloys contg. 4–12% Mg
H. W. Pathmann

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Ca

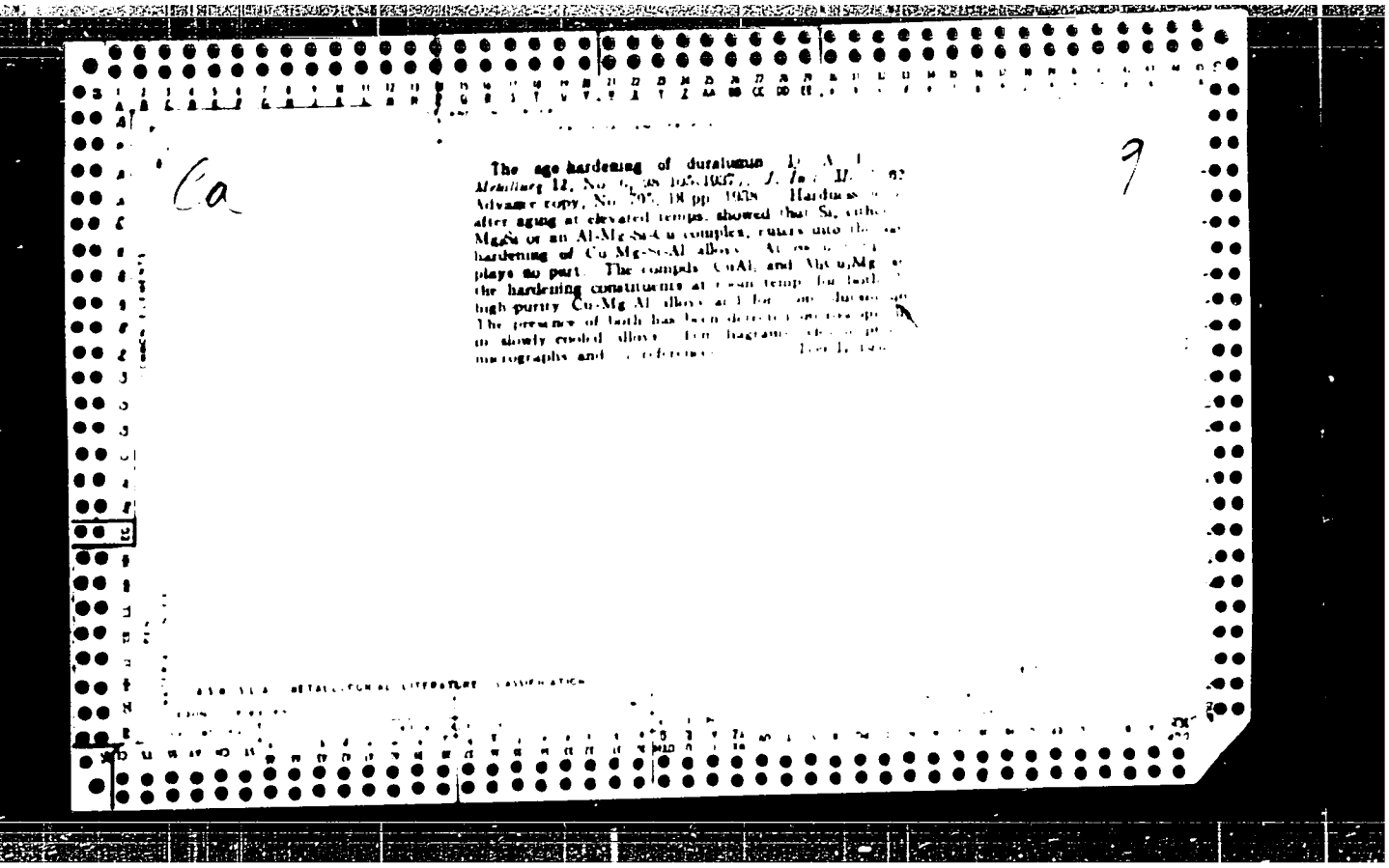
1

The influence of iron and magnesium on the aging of aluminum copper alloys

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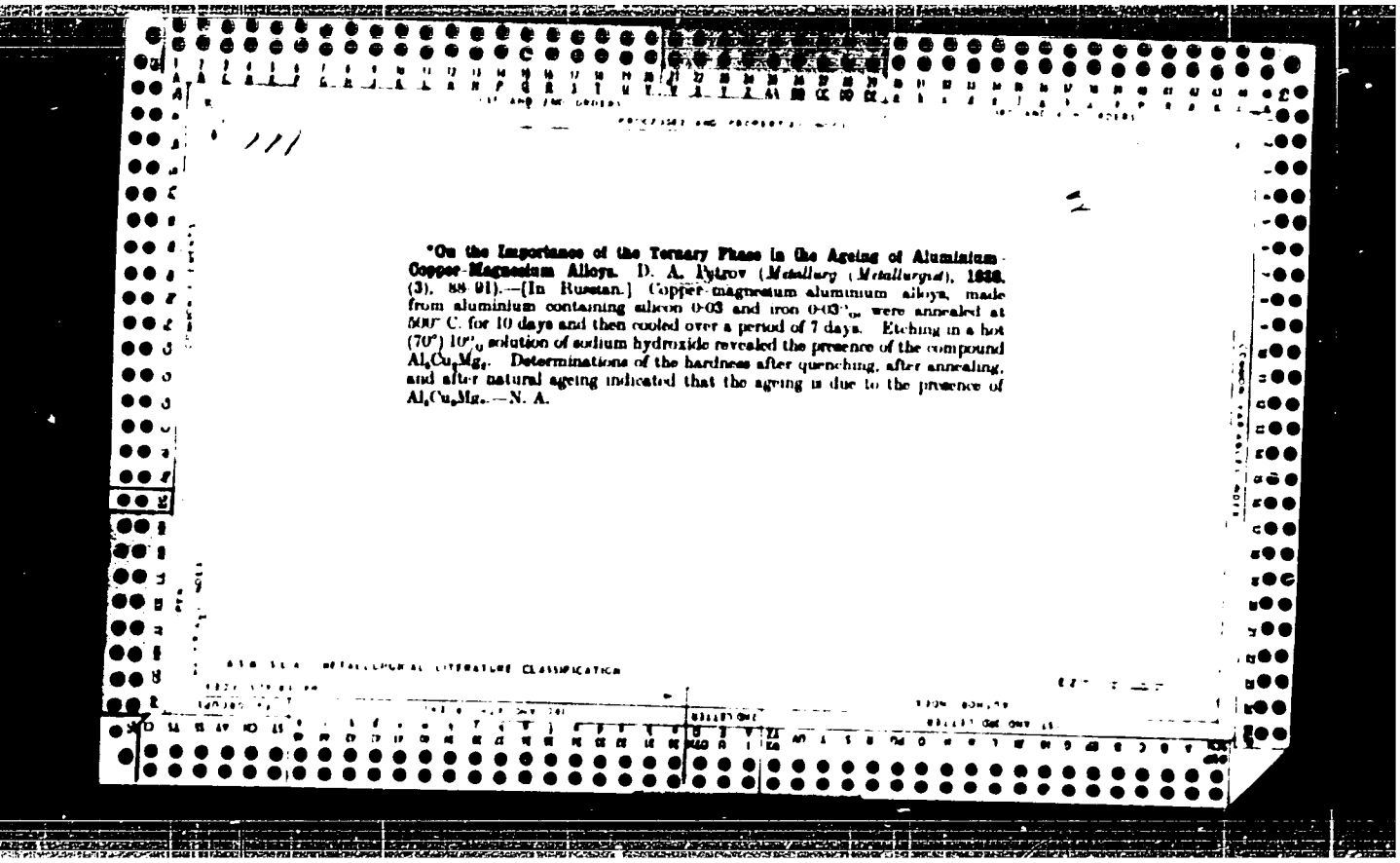
Ca

9

The age hardening of duralumin [illegible]
Metallurg 12, No [illegible] 1957, [illegible]
Advance copy, No [illegible], 18 pp 1958 Hardness [illegible]
after aging at elevated temps. showed that Si, either
Mg_2Si or an Al-Mg-Si-Cu complex, enters into the
hardening of Cu-Mg-Si-Al alloys. [illegible]
plays no part. The compds $CuAl_2$ and Al_2CuMg
the hardening constituents at room temp [illegible]
high-purity Cu-Mg Al alloys [illegible]
The presence of both has been detected [illegible]
in slowly cooled alloys [illegible]
micrographs and [illegible]

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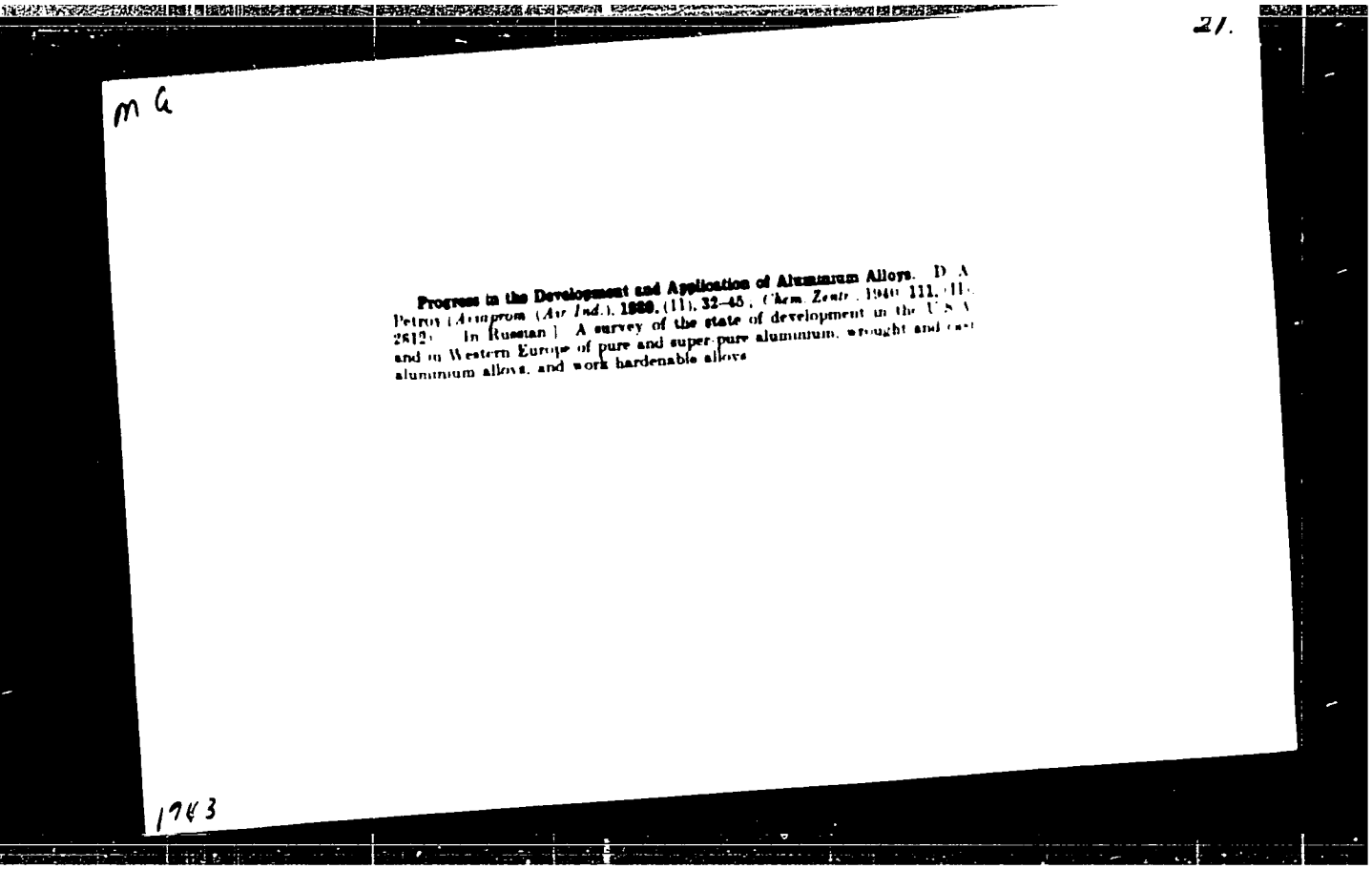
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"On the Importance of the Ternary Phase in the Ageing of Aluminium-Copper-Magnesium Alloys. D. A. Lytkov (*Metallurg* (*Metallurgist*), **1938**, (3), 88-91).—[In Russian.] Copper-magnesium aluminium alloys, made from aluminium containing silicon 0·03 and iron 0·03%, were annealed at 500° C. for 10 days and then cooled over a period of 7 days. Etching in a hot (70°) 10% solution of sodium hydroxide revealed the presence of the compound $Al_6Cu_4Mg_5$. Determinations of the hardness after quenching, after annealing, and after natural ageing indicated that the ageing is due to the presence of $Al_6Cu_4Mg_5$.—N. A.

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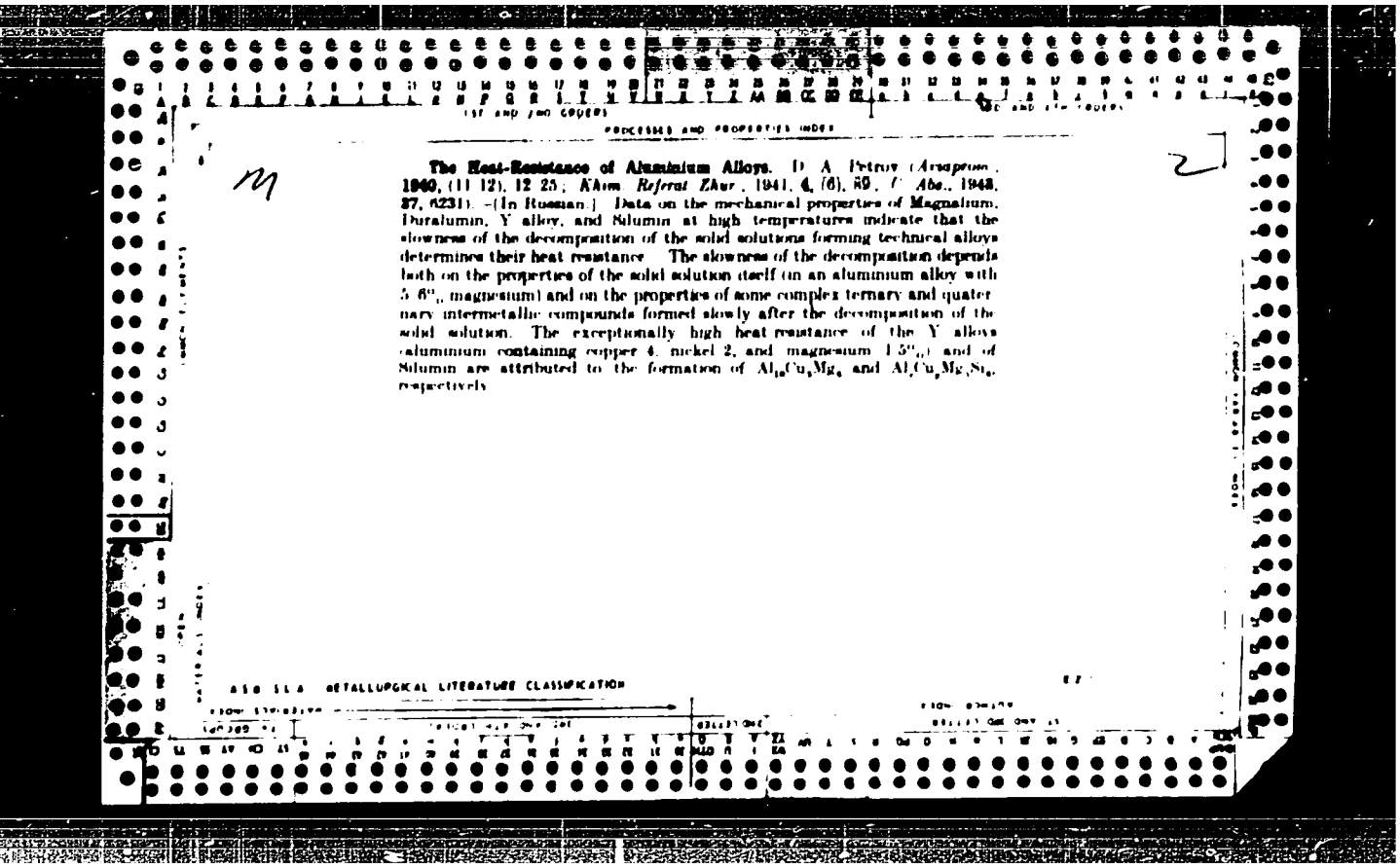
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Progress in the Development and Application of Aluminium Alloys. D. A. Petrov (*Aviaprom (Av. Ind.)*, 1939, (11), 32–45; *Chem. Zentr.*, 1940, 111, (1), 2812.) [In Russian.] A survey of the state of development in the U.S.S.R. and in Western Europe of pure and super-pure aluminium, wrought and cast aluminium alloys, and work hardenable alloys.

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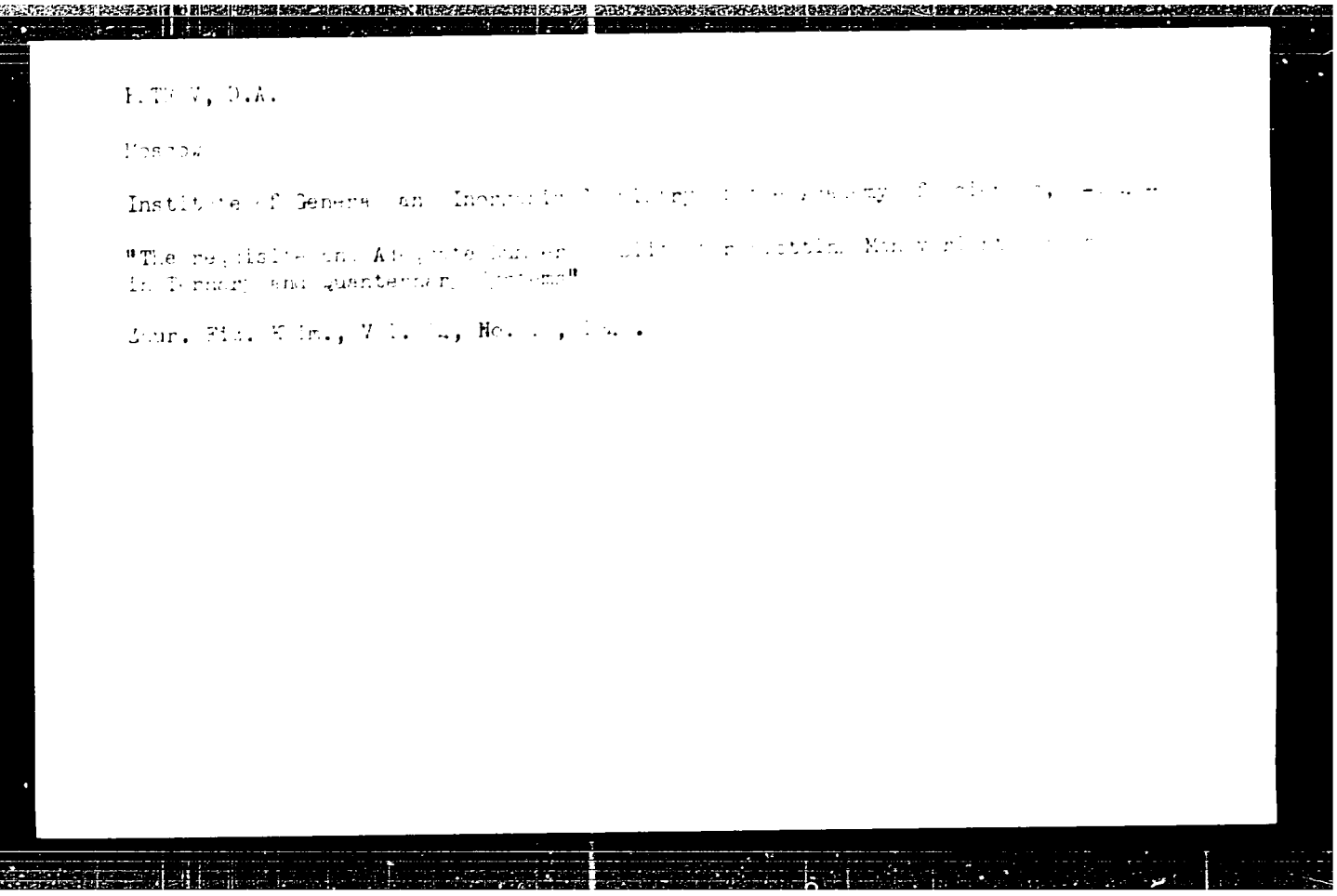
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The Heat-Resistance of Aluminium Alloys. D. A. Petrov (*Aviaprom.*, **1940**, (11 12), 12 25; *Alum. Referat. Zhur.*, 1941, **4**, (6), 89. *C. Abs.*, 1943, **37**, 6231). —[In Russian.] Data on the mechanical properties of Magnalium, Duralumin, Y alloy, and Silumin at high temperatures indicate that the slowness of the decomposition of the solid solutions forming technical alloys determines their heat resistance. The slowness of the decomposition depends both on the properties of the solid solution itself (in an aluminium alloy with 5·6% magnesium) and on the properties of some complex ternary and quaternary intermetallic compounds formed slowly after the decomposition of the solid solution. The exceptionally high heat resistance of the Y alloys (aluminium containing copper 4, nickel 2, and magnesium 1·5%) and of Silumin are attributed to the formation of $Al_6Cu_3Mg_6$ and $Al_4Cu_2Mg_5Si_4$, respectively.

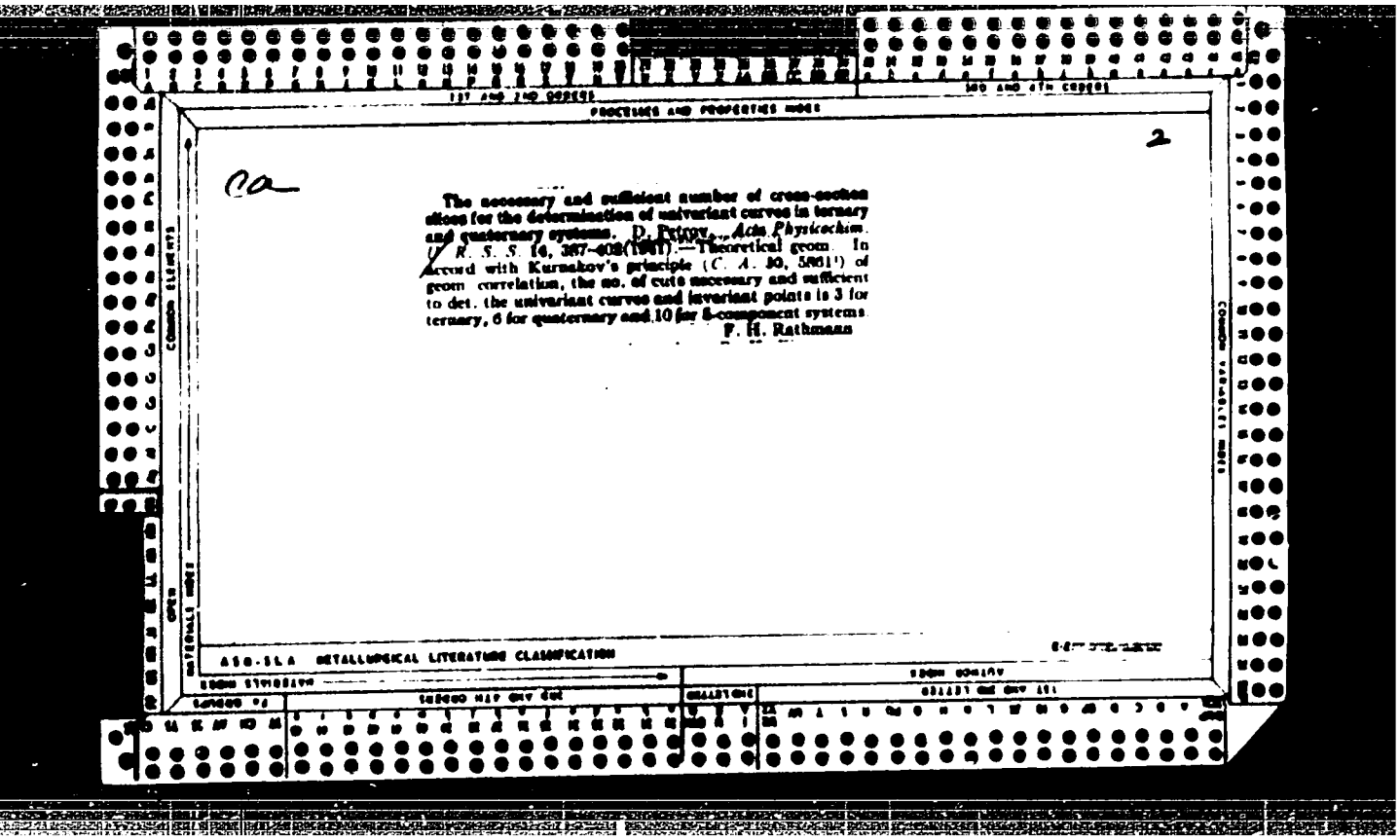
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2

Ca

The necessary and sufficient number of cross-sections for the determination of univariant curves in ternary and quaternary systems. D. Petrov. *Acta Physicochim. U. R. S. S.* 10, 367–402(1939).—Theoretical geom. In accord with Kurnakov's principle (*C. A.* 30, 5861[1]) of geom correlation, the no. of cuts necessary and sufficient to det. the univariant curves and invariant points is 3 for ternary, 6 for quaternary and 10 for 5-component systems.
F. H. Rathmann

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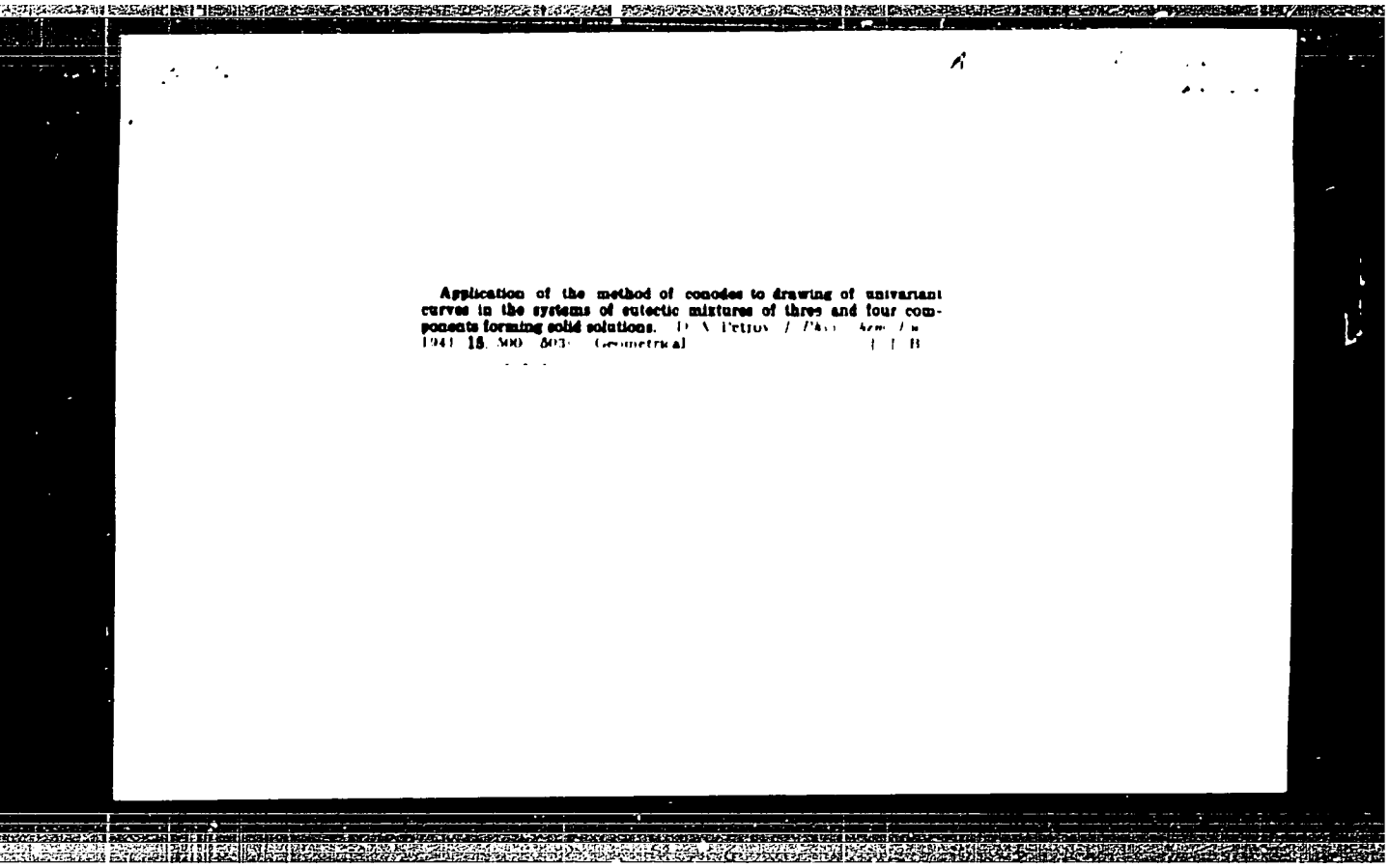
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15 C

Application of the co-node method to the determination of univariant curves for ternary and quaternary eutectic mixtures with mixed crystals. D. A. Petrov (Acta Physicochim. Acad. Sci. U.R.S.S. 1941 **14** 497 Serg. The method described in the previous abstract is extended to systems with mixed crystals.

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Application of the method of conodes to drawing of univariant curves in the systems of eutectic mixtures of three and four components forming solid solutions. [illegible]
1941 15, 309 [illegible] (Geometrical) [illegible]

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[illegible], A.

Instr. General and Interm. Chem., Acad. Sci., [illegible].

"The Investigation [illegible] Al-Th-Mn system."

Zhur. Fiz. Khim., No. [illegible].

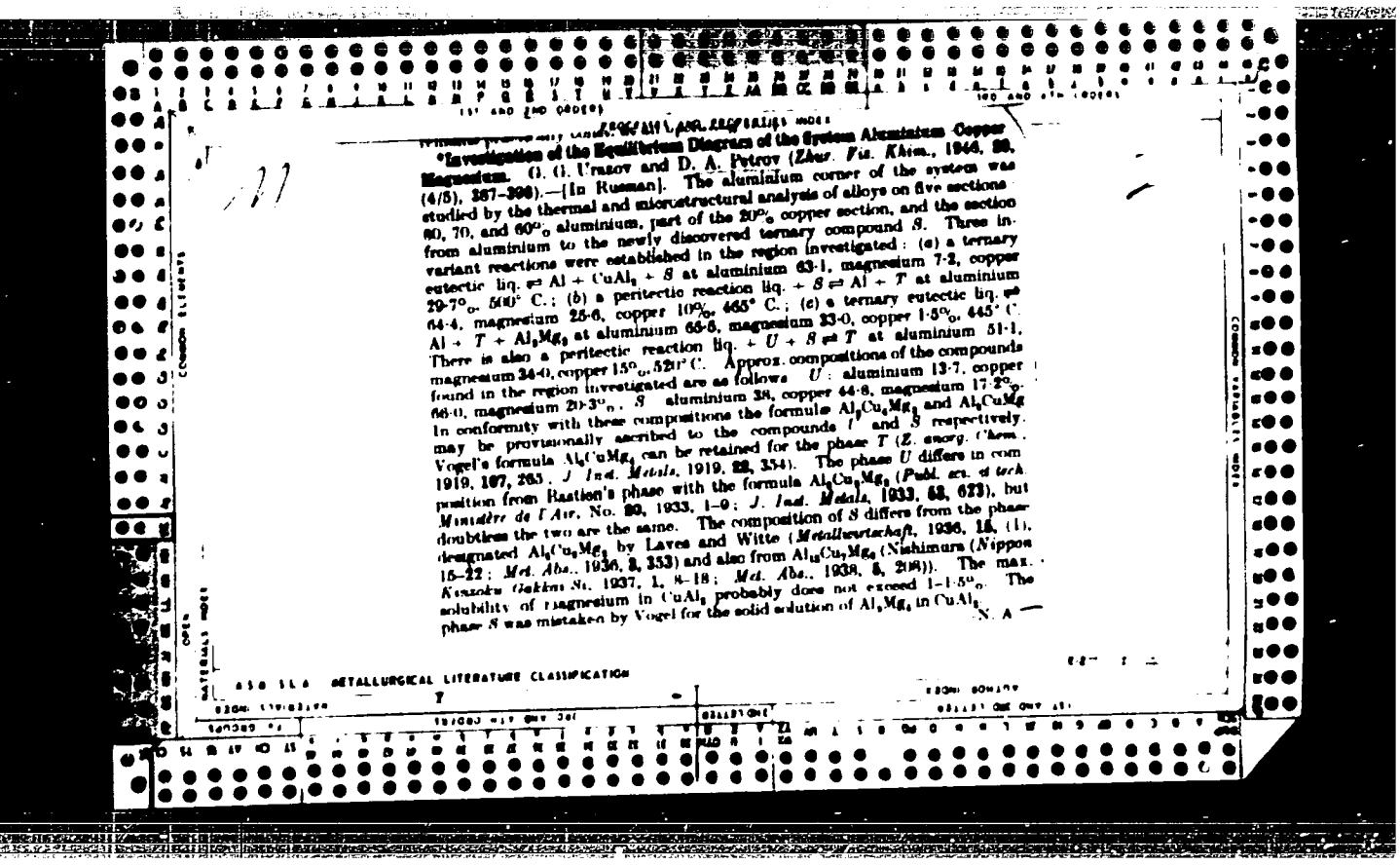
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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

Solid solutions and the aging of alloys D. A. Petrov (Acad. Sci. U.S.S.R., Moscow). *Izvest. Sektora Fiz. Khim. Analiz., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* 16, No. 2, 111-31 (1948). A decrease in the concn. of solid solns. upon lowering of temp. is a prerequisite to aging. Various changes occur in supersatd., i.e., hardened solid solns., depending whether aging takes place at low or high temp. If aging takes place at low temps., the changes in the supersatd. state consist of an aggregation of dissolved atoms into groups within the lattice of the solid soln. without disruption of the continuum of structure. By going to higher temps. the aggregation process is reversed, i.e., the groups of dissolved atoms commence to disperse, and a temp. is reached from which the solid soln. does not return to its original hardened state. The changes in a solid soln. occurring at low temp. followed by a return can be described by a metastable equil. curve. The curve for these processes has the same significance as the solv. curve has for phase decompn. At high aging temps. there occurs phase decompn. This process is described by the solv. curve on the structural diagram. M. Hosch

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***Investigation of the Equilibrium Diagram of the System Aluminium-Copper-Magnesium.** G. G. Urazov and D. A. Petrov (*Zhur. Fiz. Khim.*, 1946, **20**, (4/5), 387–398).—[In Russian]. The aluminium corner of the system was studied by the thermal and microstructural analysis of alloys on five sections 80, 70, and 60% aluminium, part of the 20% copper section, and the section from aluminium to the newly discovered ternary compound *S*. Three invariant reactions were established in the region investigated: (*a*) a ternary eutectic liq. ⇌ Al + $CuAl_2$ + *S* at aluminium 63·1, magnesium 7·2, copper 29·7%, 540° C.; (*b*) a peritectic reaction liq. + *S* ⇌ Al + *T* at aluminium 64·4, magnesium 25·6, copper 10%, 465° C.; (*c*) a ternary eutectic liq. ⇌ Al + *T* + Al_3Mg_2 at aluminium 66·8, magnesium 33·0, copper 1·5%, 445° C. There is also a peritectic reaction liq. + *U* + *S* ⇌ *T* at aluminium 51·1, magnesium 34·0, copper 15%, 521° C. Approx. compositions of the compounds found in the region investigated are as follows *U*: aluminium 13·7, copper 66·0, magnesium 20·3%. *S* aluminium 38, copper 44·8, magnesium 17·2%. In conformity with these compositions the formulæ $Al_9Cu_4Mg_5$ and Al_4CuMg may be provisionally ascribed to the compounds *U* and *S* respectively. Vogel's formula Al_6CuMg_4 can be retained for the phase *T* (*Z. anorg. Chem.*, 1919, **107**, 265; *J. Inst. Metals*, 1919, **22**, 354). The phase *U* differs in composition from Bastien's phase with the formula $Al_2Cu_3Mg_6$ (*Publ. sci. et tech. Ministère de l'Air*, No. 80, 1933, 1–9; *J. Inst. Metals*, 1933, **53**, 623), but doubtless the two are the same. The composition of *S* differs from the phase designated $Al_2Cu_3Mg_3$ by Laves and Witte (*Metallwirtschaft*, 1936, **15**, (1), 15–22; *Met. Abs.*, 1936, **3**, 353) and also from $Al_{10}Cu_3Mg_6$ (Nishimura (*Nippon Kinzoku Gakkai-Si.* 1937, **1**, 8–18; *Met. Abs.*, 1938, **5**, 208)). The max. solubility of magnesium in $CuAl_2$ probably does not exceed 1–1·5%. The phase *S* was mistaken by Vogel for the solid solution of Al_2Mg_3 in $CuAl_2$.

N. A.

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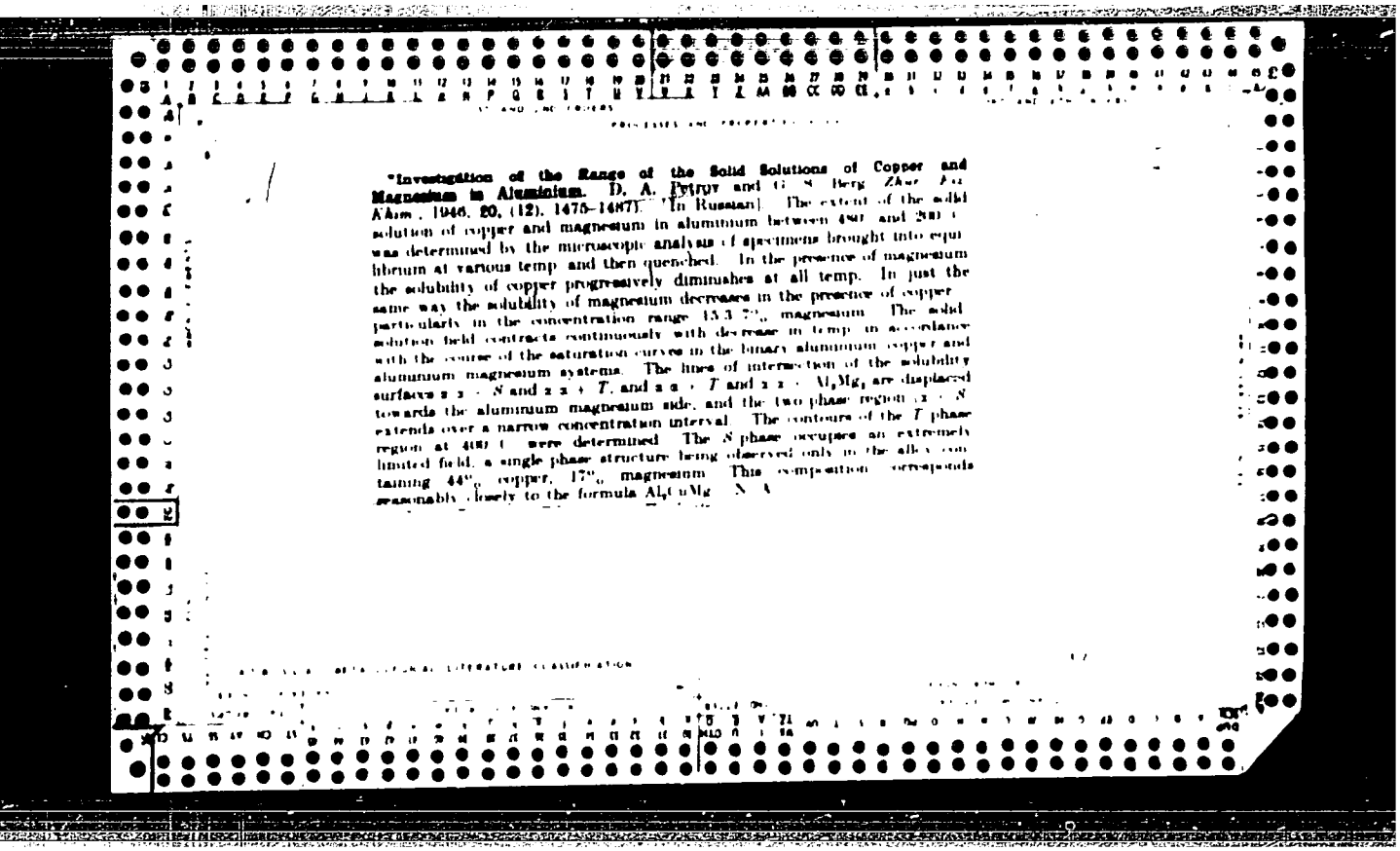
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Questions Relating to the Theory of Multi-Component Equilibrium Diagrams. D. A. Petrov (*Zhur. Fiz. Khim.*, 1946, **20**, (10), 1161–1178) [In Russian]. The equilibrium diagram of an n component system is represented by an n dimensional prism, on the base of which lies an (n − 1) dimensional concentration complex, while the height serves as temp. ordinate. The method of projecting the equilibrium diagram on to the concentration complex transforms the multi-dimensional diagram into a real co-ordinate figure in two or three dimensions. Four and five components systems are considered in the present work. N. A.

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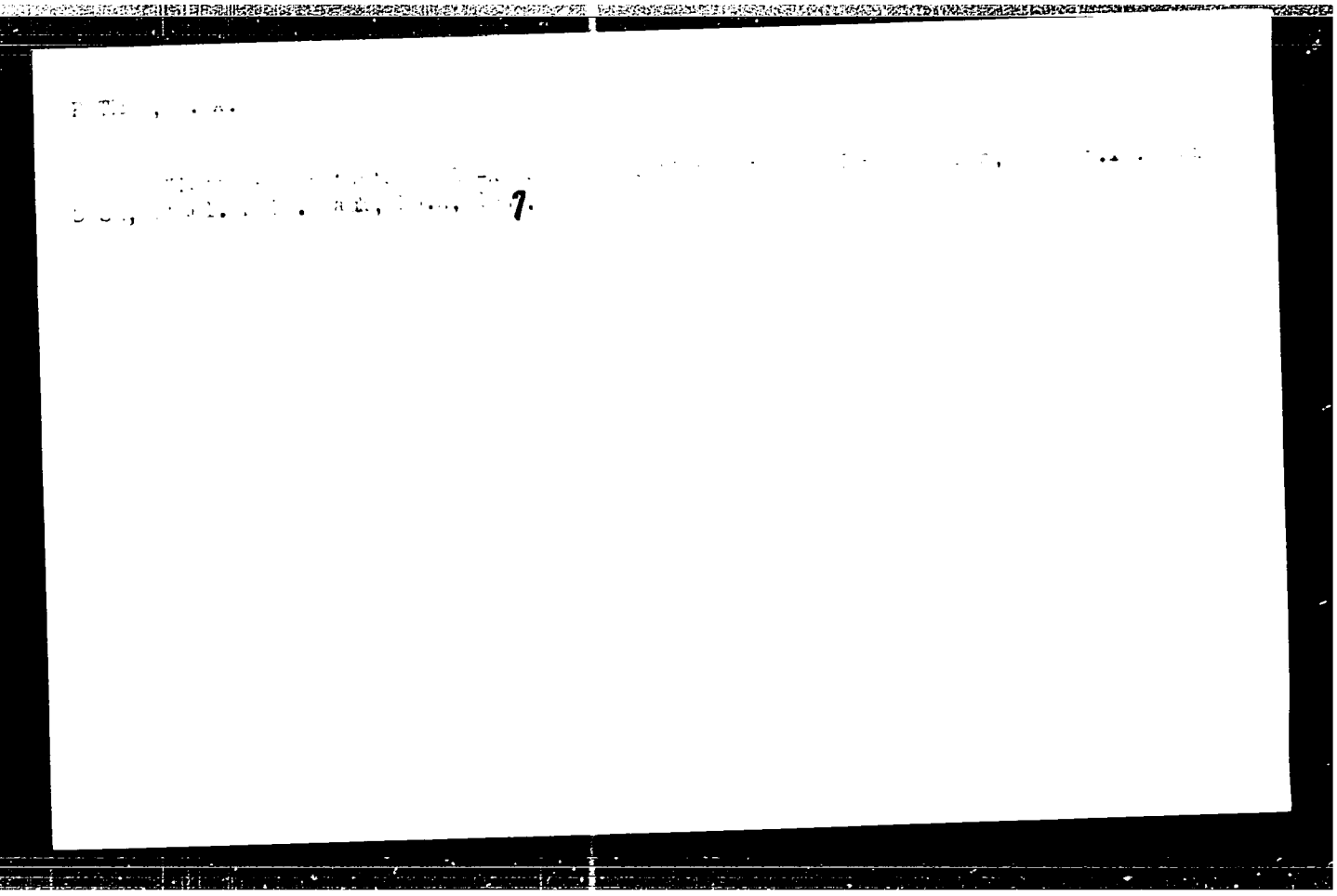
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"**Investigation of the Range of the Solid Solutions of Copper and Magnesium in Aluminium.** D. A. Petrov and [illegible] Berg. Zhur. Fiz. Khim., 1946, 20, (12), 1475–1487. [In Russian] The extent of the solid solution of copper and magnesium in aluminium between 480° and 280° was determined by the microscopic analysis of specimens brought into equilibrium at various temp. and then quenched. In the presence of magnesium the solubility of copper progressively diminishes at all temp. In just the same way the solubility of magnesium decreases in the presence of copper, particularly in the concentration range 15.3 % magnesium. The solid solution field contracts continuously with decrease in temp. in accordance with the course of the saturation curves in the binary aluminium–copper and aluminium–magnesium systems. The lines of intersection of the solubility surfaces $\alpha + S$ and $\alpha + T$, and $\alpha + T$ and $\alpha + Al_2Mg_3$ are displaced towards the aluminium–magnesium side, and the two phase region $\alpha + S$ extends over a narrow concentration interval. The contours of the T phase region at 400° were determined. The S phase occupies an extremely limited field, a single phase structure being observed only in the alloys containing 44% copper, 17% magnesium. This composition corresponds reasonably closely to the formula Al_4CuMg. N. A.

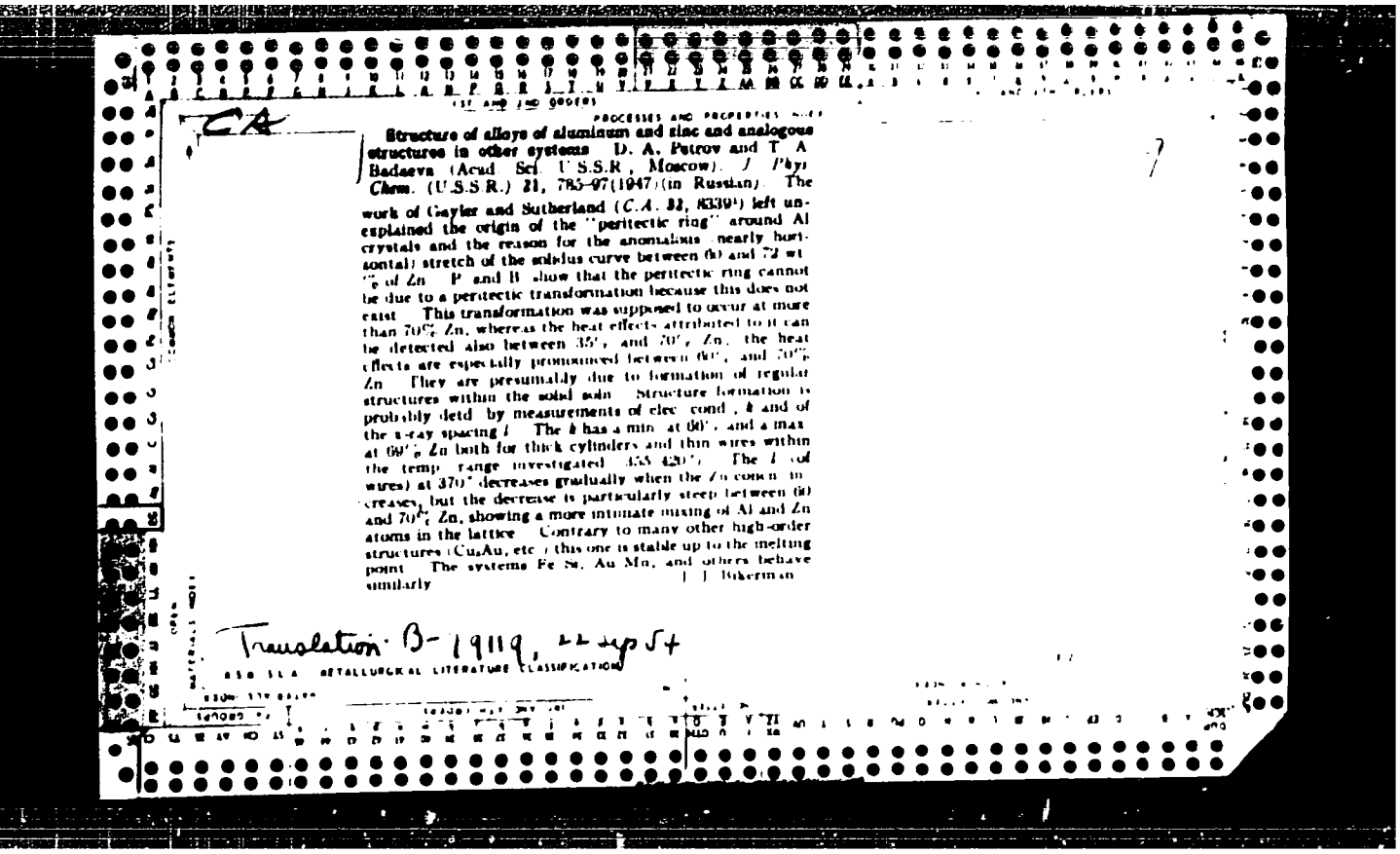
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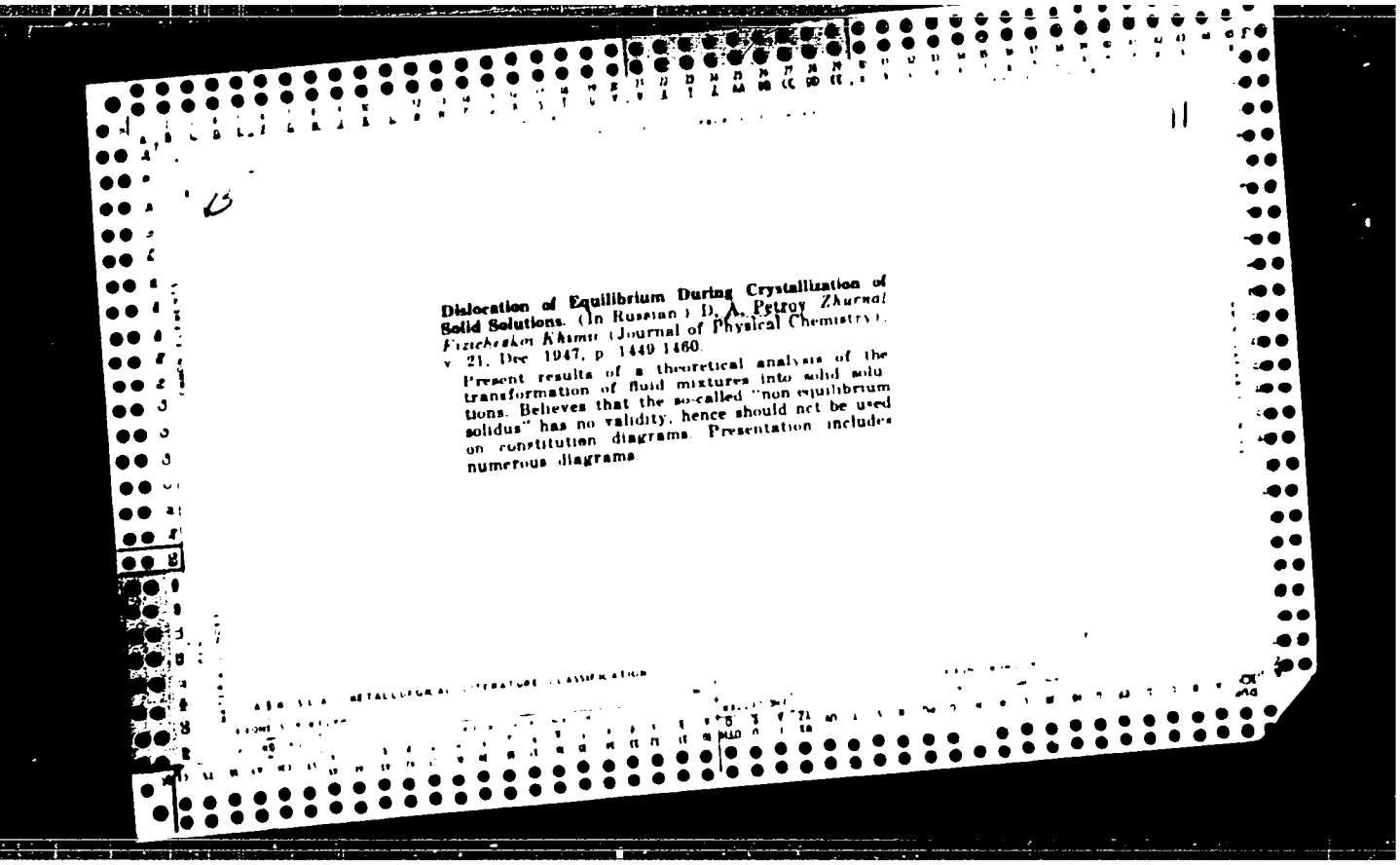
Structure of alloys of aluminum and zinc and analogous structures in other systems D. A. Petrov and T. A. Badaeva (Acad. Sci. U.S.S.R., Moscow). *J. Phys. Chem.* (U.S.S.R.) 21, 785–97(1947)(in Russian). The work of Gayler and Sutherland (*C.A.* 32, 8339[1]) left unexplained the origin of the "peritectic ring" around Al crystals and the reason for the anomalous nearly horizontal stretch of the solidus curve between 68 and 72 wt. % of Zn. P. and B. show that the peritectic ring cannot be due to a peritectic transformation because this does not exist. This transformation was supposed to occur at more than 70% Zn, whereas the heat effects attributed to it can be detected also between 35% and 70% Zn; the heat effects are especially pronounced between 60% and 70% Zn. They are presumably due to formation of regular structures within the solid soln. Structure formation is probably detd. by measurements of elec. cond., *k*, and of the x-ray spacing *l*. The *k* has a min. at 60% and a max. at 69% Zn both for thick cylinders and thin wires within the temp. range investigated (455–420°). The *l* (of wires) at 370° decreases gradually when the Zn content increases, but the decrease is particularly steep between 68 and 70% Zn, showing a more intimate mixing of Al and Zn atoms in the lattice. Contrary to many other high-order structures (Cu$_3$Au, etc.), this one is stable up to the melting point. The systems Fe–Si, Au–Mn, and others behave similarly. J. J. Bikerman

Translation B-1911, 22 pp Sf

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Dislocation of Equilibrium During Crystallization of Solid Solutions. (In Russian.) D. A. Petrov. *Zhurnal Fizicheskoi Khimii* (Journal of Physical Chemistry), v. 21, Dec. 1947, p. 1449-1460.

Present results of a theoretical analysis of the transformation of fluid mixtures into solid solutions. Believes that the so-called "non equilibrium solidus" has no validity, hence should not be used on constitution diagrams. Presentation includes numerous diagrams.

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PETROV, D. A.; KEFELI, L. M., and LEL'CHUK, S. L.

"Investigation of the Structure of the Copper Skeleton Catalyst," Dok. AN, 57, No. 6, 1947

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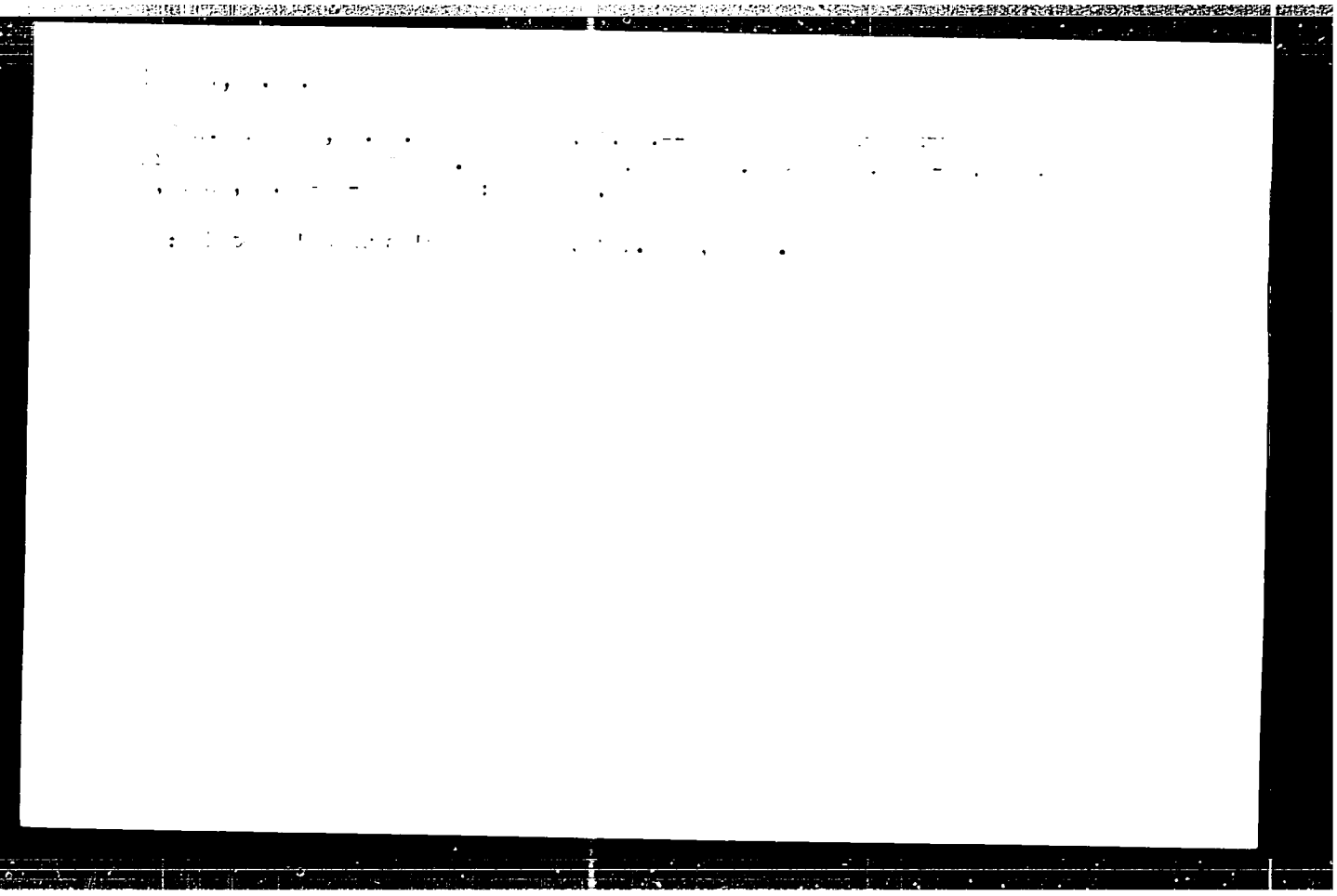
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M. A. 3.

Study of the Forms of Primary Crystallisation in Alloys. D. A. Petrov and A. A. Bukhanova (Izvest. Akad. Nauk S.S.S.R., 1949, (Khim.), (4), 396-409; C. Abs., 1950, 44, 895).-(In Russian). Experimental results agreed with Gibbs' condition, $\Sigma\sigma_i S_i$ = minimum for a const. vol., where σ_i is the surface energy of a crystal face and S_i is the surface area of the crystal face, and with Bravais's condition that the plane of closest packing grows fastest. The energy of atoms in a crystal was assumed greater the larger the unbalanced binding energy. The equilibrium crystal form in face-centered cubic crystals should be {111}. Although an evaporation method is possible, aluminium crystals were grown by cooling melts in the aluminium-tin system at 10-15°C./hr.; 99·7% aluminium and 99·5% tin were used. Crystals grown in 1-5% aluminium melts were found by metallographic examination of the solidified melt to be perfect octahedra; those grown in melts containing above 20% had oval cross-sections; intermediate compositions gave transition forms. Experiments on 99·5% lead-0·5% aluminium alloys gave perfect crystals at low temp. and oval forms at high temp. This temp. effect was found also in the formation of copper crystals from bismuth-copper and antimony crystals from lead-antimony alloys. The equilibrium form of silicon crystals was dodecahedral from tin-silicon melts. The reason for the formation of dendrites is the difference in binding energy of the atoms at various positions

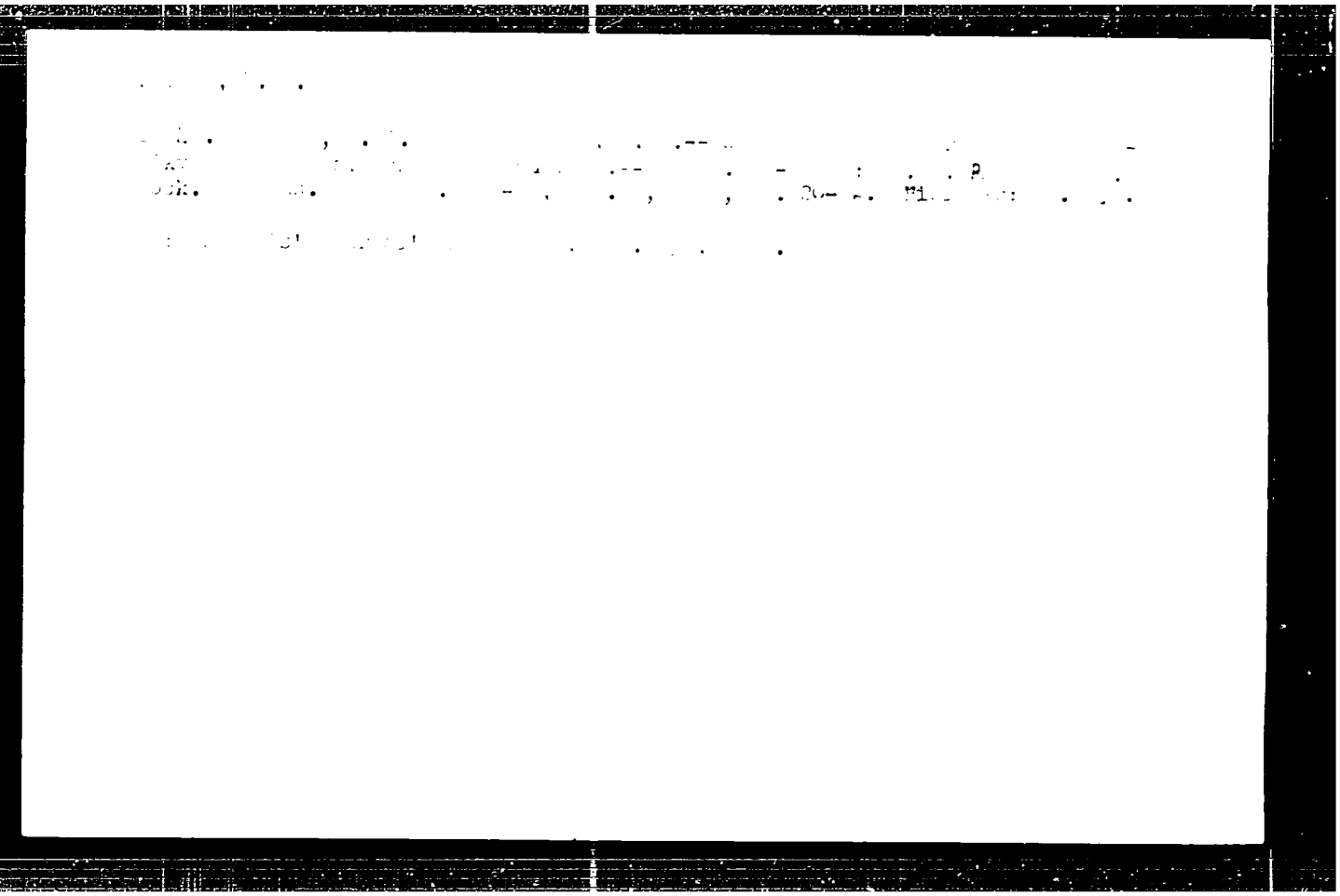
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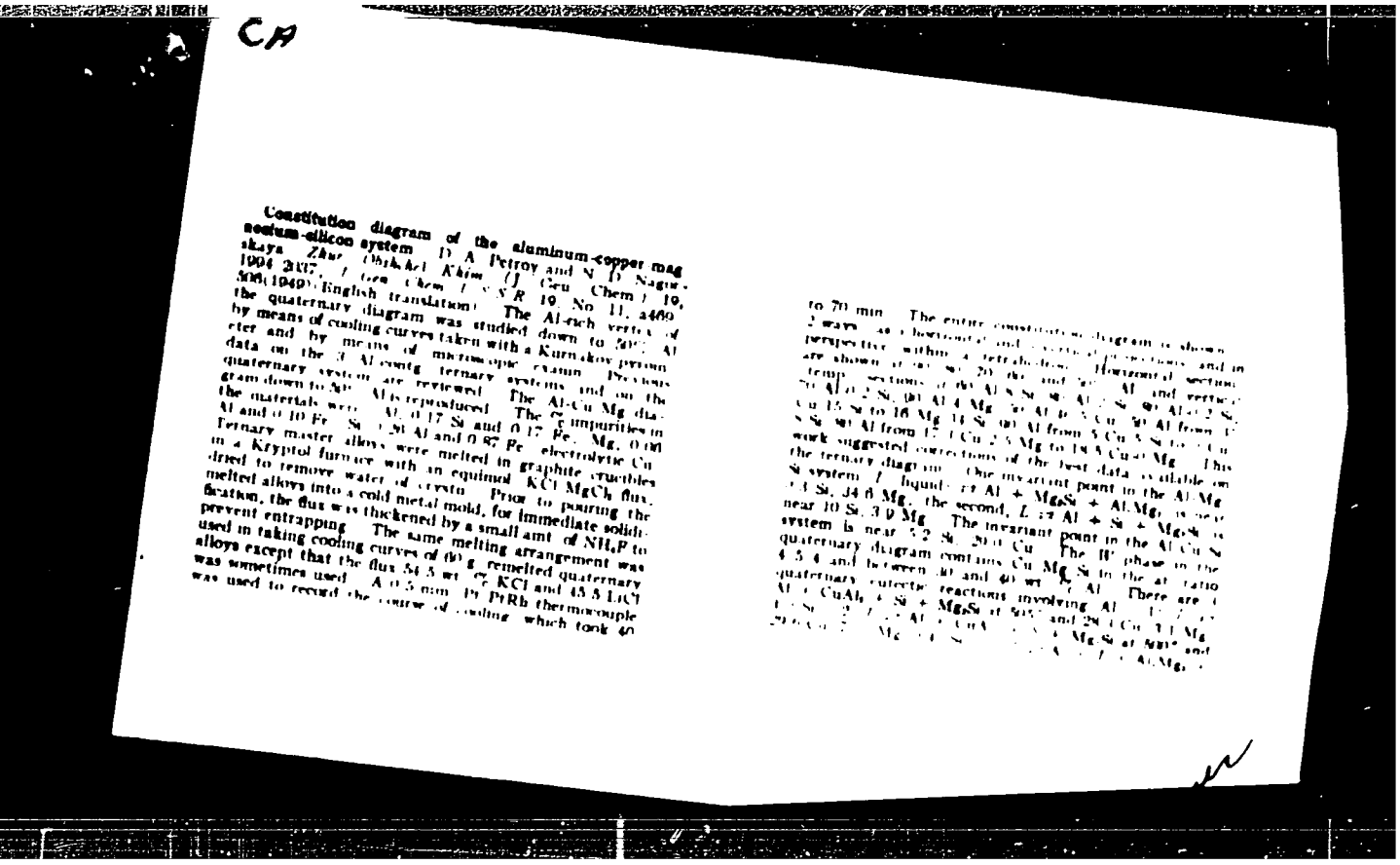
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CA

Constitution diagram of the aluminum-copper magnesium-silicon system D A Petrov and N D Nagirskaya *Zhur Obshch Khim (J Gen Chem)* 19, 1904 2017 (1949) [English translation] *J Gen Chem USSR* 19 No 11, 2469-508 (1949) [English translation] The Al-rich vertex of the quaternary diagram was studied down to 20° Al by means of cooling curves taken with a Kurnakov pyrometer and by means of microscopic examn Previous data on the 3 Al-containg ternary systems and on the quaternary system are reviewed The Al-Cu-Mg diagram down to 20° Al is reproduced The Cu impurities in the materials were Al, 0 17 Si and 0 17 Fe, Mg, 0 08 Al and 0 10 Fe Si, 1 80 Al and 0 87 Fe electrolytic Cu Ternary master alloys were melted in graphite crucibles in a Kryptol furnace with an equimol KCl MgCl2 flux dried to remove water of cryst Prior to pouring the melted alloys into a cold metal mold, for immediate solidification, the flux was thickened by a small amt of NH_4F to prevent entrapping The same melting arrangement was used in taking cooling curves of 60 g remelted quaternary alloys except that the flux 54 5 wt % KCl and 45 5 LiCl was sometimes used A 0 5 mm Pt PtRh thermocouple was used to record the course of cooling which took 40 to 70 min The entire constitution diagram is shown 2 ways as a horizontal and vertical projection and in perspective within a tetrahedron Horizontal sections are shown at 20° the and 20° Al and vertical temp sections of the Al Si Mg Al and vertical Cu 15 Si to 16 Mg 14 Si at Al from 5 Cu 5 Si to Cu 5 Si at Al from 17 Cu 2 5 Mg to 14 5 Cu at Mg This work suggested corrections of the best data available on the ternary diagram The invariant point in the Al Mg Si system, liquid + Al + Mg_2Si + Al_8Mg_5, is near 1 1 Si, 34 6 Mg, the second, L + Al + Si + Mg_2Si, is near 10 Si, 3 9 Mg The invariant point in the Al Cu Si system is near 5 2 Si, 20 0 Cu The W phase in the quaternary diagram contains Cu Mg Si in the at ratio 4 5 4 and is between 40 and 40 wt % Al There are quaternary eutectic reactions involving Al + $CuAl_2$ + Si + Mg_2Si at 525° and 28 1 Cu 7 1 Mg Al + $CuAl_2$ + Mg_2Si at 500° and Al + Al_8Mg_5 +

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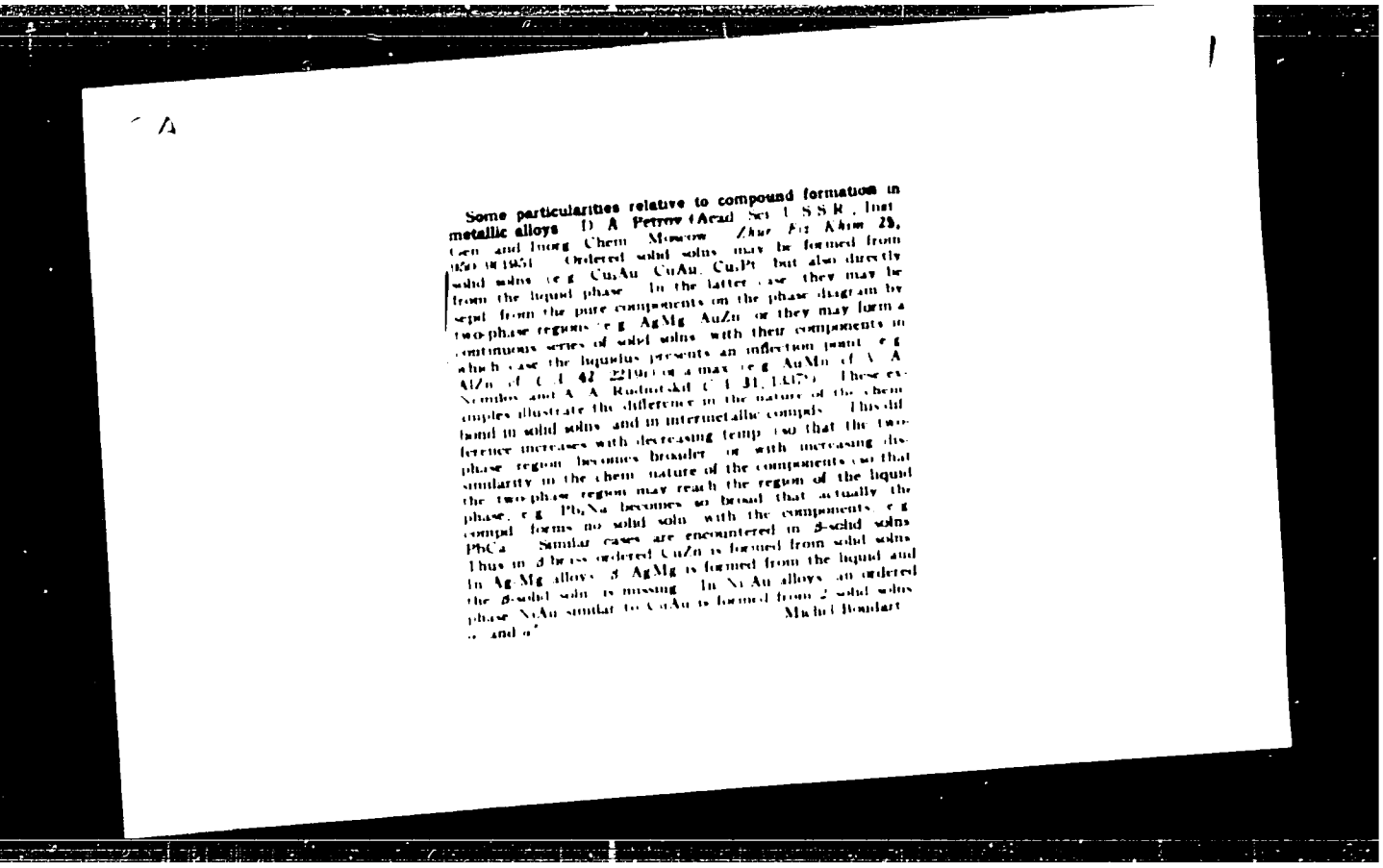
Technology

Problems in the theory of aluminum alloys. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1951

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Unclassified.

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Some particularities relative to compound formation in metallic alloys D A Petrov (Acad Sci U S S R, Inst Gen and Inorg Chem Moscow) *Zhur Fiz Khim* **25**, 1650 (1951) Ordered solid solns may be formed from solid solns (e g Cu$_3$Au CuAu, Cu$_3$Pt but also directly from the liquid phase In the latter case they may be sepd from the pure components on the phase diagram by two-phase regions (e g AgMg AuZn) or they may form a continuous series of solid solns with their components in which case the liquidus presents an inflection point (e g AlZn of C I **42** 2210(1) or a max (e g AuMn of A A Nemilov and A A Rudnitskii C I **31**, 1437) These examples illustrate the difference in the nature of the chem bond in solid solns and in intermetallic compds This difference increases with decreasing temp so that the two-phase region becomes broader or with increasing dissimilarity in the chem nature of the components so that the two-phase region may reach the region of the liquid phase, e g PbNa becomes so broad that actually the compd forms no solid soln with the components e g PbCa Similar cases are encountered in β-solid solns Thus in β brass ordered CuZn is formed from solid solns In AgMg alloys β AgMg is formed from the liquid and the β-solid soln is missing In NiAu alloys an ordered phase NiAu similar to CuAu is formed from 2 solid solns Michel Boudart

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PETROV, D.A.; RAYKOVSKAYA, L.A.

Intercrystalline liquation by the method of microhardness. Izvest. Akad. Nauk S.S.S.R., Otdel Khim.Nauk '52, 225-9. (MLRA 5:5)
(CA 47 no.15:7416 '53)

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

PETROV, D.A.; AGEYEV, N.V., redaktor.

[Ternary systems] Troinye sistemy. [Otvestvennyi redaktor N.V.Ageev] Moskva, Izd-vo Akademii nauk SSSR, 1953. 313 p. (MLRA 6:10)
(Systems (Chemistry))

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420009-9

PETROV, D.A., doktor tekhnicheskikh nauk, professor.

[Aging of metals] Starenie metallov. Moskva, Izd-vo "Znanie", 1953. 22 p. (MLRA 6:11)

(Metals)

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Petrov, D.A.

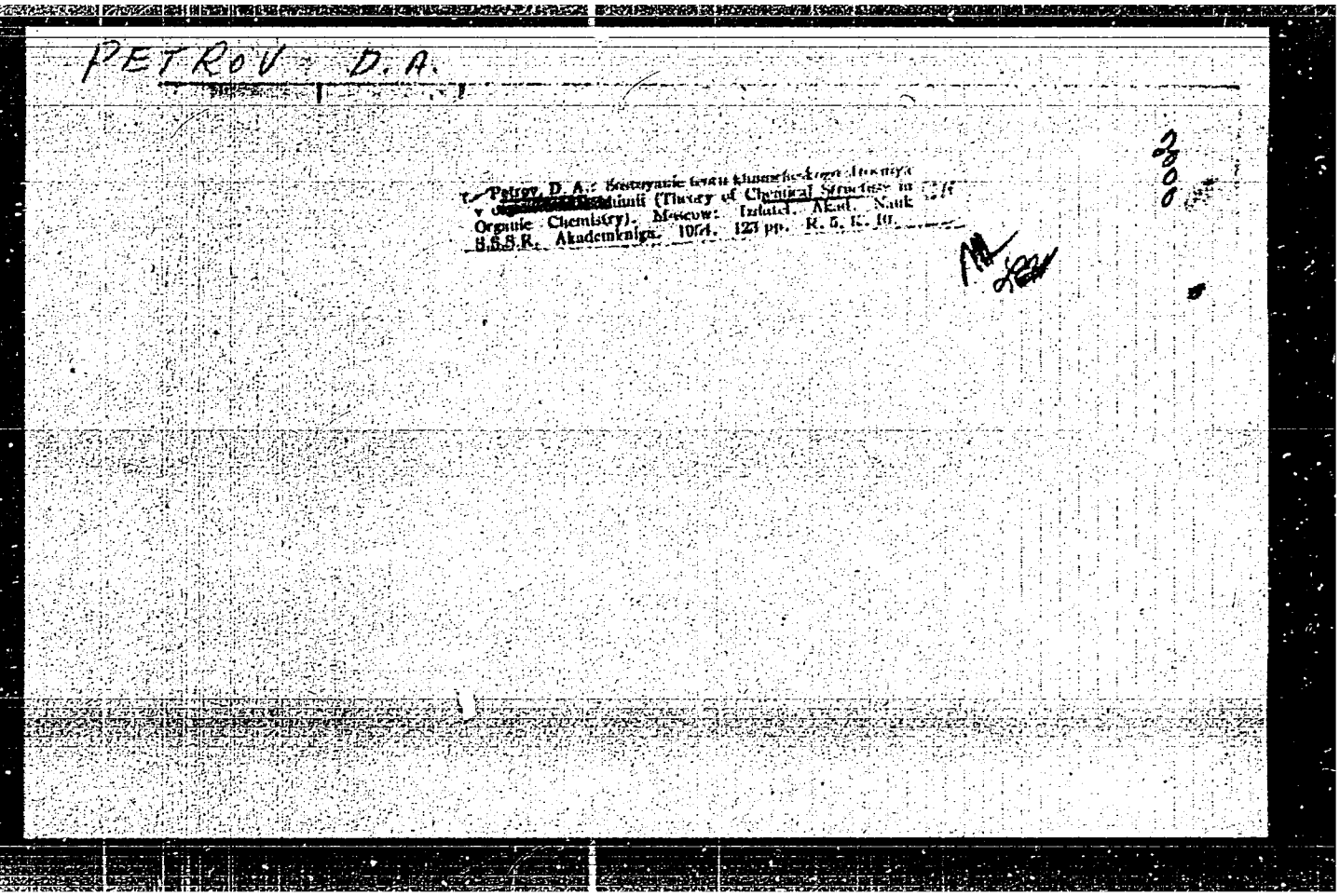
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4E 4C
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Aging of metals. D. A. Petrov. *Nauka i Zhizn* 1953, No. 8, 26–8; *Referat. Zhur., Fiz.* 1954, Abstr. No. 4944.—The alloying of a metal with subsequent thermal treatment (quenching and natural or synthetic aging) increases the tensile strength by a factor of 2.5–3 (Ni–Cu alloy contg. 4% Al) and sometimes by more than a factor of 10. Cu has a tensile strength of 25 kg./sq. mm., and that of aged Be bronze is 400–500 kg./sq. mm. The process of structural transitions in an alloy Al + 4% Cu upon aging which leads to an increase in hardness was described. The presence of Mg and Mn in duralumin complicates the process of dispersion solidification but it does not change the essence of the process. "Supersging," i.e., softening of an alloy by heating to very high temps. (or for a long period of time), is related to the transition from intermediate, submicroscopic structures to the final structure with a weakening of internal tensions and a decrease in hardness. I. Rovtar Leach

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